JEFFERSON MATH PROJECT REGENTS AT RANDOM

The NY Integrated Algebra Regents Exams
Fall 2007-August 2011
(Answer Key)

www.jmap.org

Dear Sir

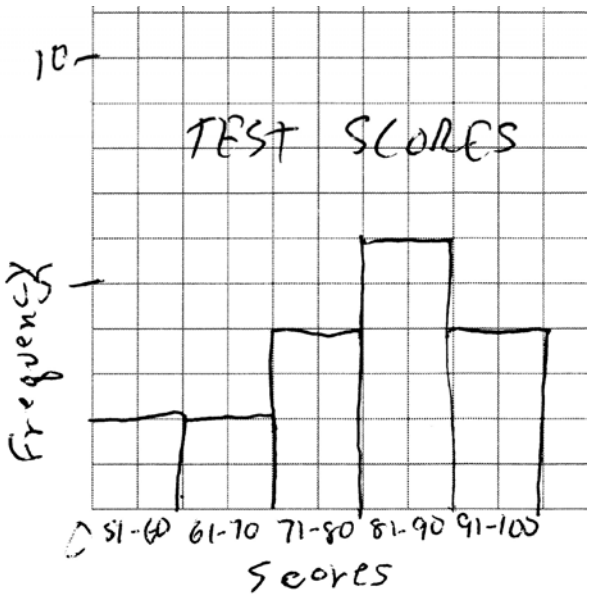
I have to acknolege the reciept of your favor of May 14. in which you mention that you have finished the 6. first books of Euclid, plane trigonometry, surveying & algebra and ask whether I think a further pursuit of that branch of science would be useful to you. there are some propositions in the latter books of Euclid, & some of Archimedes, which are useful, & I have no doubt you have been made acquainted with them. trigonometry, so far as this, is most valuable to every man, there is scarcely a day in which he will not resort to it for some of the purposes of common life. the science of calculation also is indispensible as far as the extraction of the square & cube roots; Algebra as far as the quadratic equation & the use of logarithms are often of value in ordinary cases: but all beyond these is but a luxury; a delicious luxury indeed; but not to be indulged in by one who is to have a profession to follow for his subsistence. in this light I view the conic sections, curves of the higher orders, perhaps even spherical trigonometry, Algebraical operations beyond the 2d dimension, and fluxions.

Letter from Thomas Jefferson to William G. Munford, Monticello, June 18, 1799.

Integrated Algebra Regents at Random
Answer Section

1 ANS:

Interval	Tally	Frequency
51–60	II	2
61–70	II	2
71–80	IIII	4
81–90	IIII I	6
91–100	IIII	4



PTS: 3 REF: 011135ia STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables KEY: frequency histograms

2 ANS:

$$\frac{3k^2m^6}{4}$$

PTS: 2 REF: 010932ia STA: A.A.12 TOP: Division of Powers

3 ANS: 3

$$x^2 - 9 = 0$$

$$(x+3)(x-3) = 0$$

$$x = \pm 3$$

PTS: 2 REF: 061014ia STA: A.A.15 TOP: Undefined Rationals

4 ANS: 4

$A = lw = (3w-7)(w) = 3w^2 - 7w$

PTS: 2 REF: 010924ia STA: A.A.1 TOP: Expressions

5 ANS: 1 PTS: 2 REF: 061114ia STA: A.A.43
TOP: Using Trigonometry to Find an Angle

6 ANS: 3

$c + 3d = 8 \quad c = 4d - 6$

$4d - 6 + 3d = 8 \quad c = 4(2) - 6$

$7d = 14 \quad c = 2$

$d = 2$

PTS: 2 REF: 061012ia STA: A.A.10 TOP: Solving Linear Systems

7 ANS: 2 PTS: 2 REF: 011022ia STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

8 ANS: 2

$P = 2l + 2w$

$P - 2l = 2w$

$\frac{P - 2l}{2} = w$

PTS: 2 REF: 010911ia STA: A.A.23 TOP: Transforming Formulas

9 ANS: 2 PTS: 2 REF: 011005ia STA: A.A.5
TOP: Modeling Inequalities

10 ANS: 2 PTS: 2 REF: 011012ia STA: A.G.9
TOP: Quadratic-Linear Systems

11 ANS:
15,600,000, 4,368,000. $10 \times 10 \times 10 \times 26 \times 25 \times 24 = 15,600,000$. $10 \times 9 \times 8 \times 26 \times 25 \times 24 = 11,232,000$.
$15,600,000 - 11,232,000 = 4,368,000$.

PTS: 4 REF: 011037ia STA: A.N.8 TOP: Permutations

12 ANS: 4 PTS: 2 REF: 010929ia STA: A.S.6
TOP: Box-and-Whisker Plots

13 ANS: 1 PTS: 2 REF: 061021ia STA: A.A.29
TOP: Set Theory

14 ANS: 4
$6\sqrt{50} + 6\sqrt{2} = 6\sqrt{25}\sqrt{2} + 6\sqrt{2} = 30\sqrt{2} + 6\sqrt{2} = 36\sqrt{2}$

PTS: 2 REF: 011024ia STA: A.N.3 TOP: Operations with Radicals
KEY: addition

15 ANS:
(T,J,F), (T,J,N), (T,K,F), (T,K,N), (T,C,F), (T,C,N), (B,J,F), (B,J,N), (B,K,F), (B,K,N), (B,C,F), (B,C,N), (S,J,F), (S,J,N), (S,K,F), (S,K,N), (S,C,F), (S,C,N). 3, 12.

PTS: 4 REF: 061138ia STA: A.S.19 TOP: Sample Space

16 ANS:
$\frac{x^2 + 9x + 14}{x^2 - 49} \div \frac{3x + 6}{x^2 + x - 56} = \frac{(x + 7)(x + 2)}{(x + 7)(x - 7)} \cdot \frac{(x + 8)(x - 7)}{3(x + 2)} = \frac{x + 8}{3}$

PTS: 4 REF: 061037ia STA: A.A.18 TOP: Multiplication and Division of Rationals

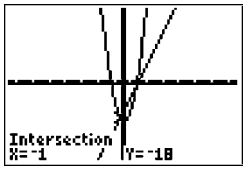
17 ANS:

$$\frac{x^2 - 5x - 24}{x - 8} = \frac{(x - 8)(x + 3)}{x - 8} = x + 3$$

PTS: 2 REF: 061131ia STA: A.A.14 TOP: Division of Polynomials

18 ANS: 2

$x^2 - x - 20 = 3x - 15$. $y = 3x - 15$.



$x^2 - 4x - 6 = 0$ $= 3(-1) - 15$

$(x = 5)(x + 1) = 0$ $= -18$

$x = 5$ or -1

PTS: 2 REF: 010922ia STA: A.A.11 TOP: Quadratic-Linear Systems

19 ANS: 1

$2(x - 4) = 4(2x + 1)$

$2x - 8 = 8x + 4$

$-12 = 6x$

$-2 = x$

PTS: 2 REF: 011106ia STA: A.A.22 TOP: Solving Equations

20 ANS:

50. $12 + 10 + 12 + \frac{1}{2}(10\pi) \approx 50$

PTS: 2 REF: 010931ia STA: A.G.1 TOP: Compositions of Polygons and Circles
KEY: perimeter

21 ANS:

$d = 6.25h$, 250. $d = 6.25(40) = 250$

PTS: 2 REF: 010933ia STA: A.N.5 TOP: Direct Variation

22 ANS: 3 PTS: 2 REF: 061101ia STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

23 ANS: 2 PTS: 2 REF: 011119ia STA: A.A.29
TOP: Set Theory

24 ANS: 2 PTS: 2 REF: 011110ia STA: A.N.6
TOP: Evaluating Expressions

25 ANS:

$$\frac{600 - 592}{592} \approx 0.014$$

PTS: 2 REF: 061031ia STA: A.M.3 TOP: Error
KEY: volume and surface area

26 ANS: 4

$V = \pi r^2 h = \pi \cdot 6^2 \cdot 15 \approx 1696.5$

PTS: 2 REF: fall0712ia STA: A.G.2 TOP: Volume

27 ANS:

53. $\sin A = \frac{16}{20}$

$A \approx 53$

PTS: 2 REF: 011032ia STA: A.A.43 TOP: Using Trigonometry to Find an Angle

28 ANS: 3

$F = \frac{9}{5}C + 32 = \frac{9}{5}(15) + 32 = 59$

PTS: 2 REF: 010901ia STA: A.M.2 TOP: Conversions

29 ANS: 3

$5x + 2y = 48$

$3x + 2y = 32$

$2x = 16$

$x = 8$

PTS: 2 REF: fall0708ia STA: A.A.10 TOP: Solving Linear Systems

30 ANS: 1 PTS: 2 REF: 011101ia STA: A.A.31
TOP: Set Theory

31 ANS: 4 PTS: 2 REF: fall0704ia STA: A.A.29
TOP: Set Theory

32 ANS: 3

$m = \frac{7-3}{-3-3} = \frac{4}{-6} = -\frac{2}{3}$ $y = mx + b$

$3 = -\frac{2}{3}(3) + b$

$3 = -2 + b$

$5 = b$

PTS: 2 REF: 011013ia STA: A.A.35 TOP: Writing Linear Equations

33 ANS:

$-\frac{9}{4}$. $\frac{3}{4} = \frac{-(x+11)}{4x} + \frac{1}{2x}$

$\frac{3}{4} = \frac{-x-11}{4x} + \frac{2}{4x}$

$\frac{3}{4} = \frac{-x-9}{4x}$

$12x = -4x - 36$

$16x = -36$

$x = -\frac{9}{4}$

PTS: 4 REF: 061137ia STA: A.A.26 TOP: Solving Rationals

34 ANS: 4 PTS: 2 REF: 061130ia STA: A.A.13
TOP: Addition and Subtraction of Polynomials KEY: subtraction

35 ANS: 2

In (2), each element in the domain corresponds to a unique element in the range.

PTS: 2 REF: 061116ia STA: A.G.3 TOP: Defining Functions

36 ANS: 1

$-|a-b| = -|7-(-3)| = -|-10| = -10$

PTS: 2 REF: 011010ia STA: A.N.6 TOP: Evaluating Expressions

37 ANS: 3

$\frac{(10w^3)^2}{5w} = \frac{100w^6}{5w} = 20w^5$

PTS: 2 REF: 011124ia STA: A.A.12 TOP: Powers of Powers

38 ANS: 4 PTS: 2 REF: 061112ia STA: A.A.36
TOP: Parallel and Perpendicular Lines

39 ANS: 2

$\frac{6}{5x} - \frac{2}{3x} = \frac{18x-10x}{15x^2} = \frac{8x}{15x^2} = \frac{8}{15x}$

PTS: 2 REF: 010921ia STA: A.A.17 TOP: Addition and Subtraction of Rationals

40 ANS: 2 PTS: 2 REF: 010925ia STA: A.A.15
TOP: Undefined Rationals

41 ANS: 3

$\frac{12x^3 - 6x^2 + 2x}{2x} = \frac{2x(6x^2 - 3x + 1)}{2x} = 6x^2 - 3x + 1$

PTS: 2 REF: 011011ia STA: A.A.14 TOP: Division of Polynomials

42 ANS: 2

$J - M = 3$

$8J + 8M = 120$

$8J - 8M = 24$

$16J = 144$

$J = 9$

PTS: 2 REF: 011115ia STA: A.A.7 TOP: Writing Linear Systems

43 ANS:

5. $48 \text{ inches} \times \frac{1 \text{ yard}}{36 \text{ inches}} = \frac{4}{3} \text{ yards} \times \$3.75 = \$5.00$

PTS: 2 REF: 011131ia STA: A.M.2 TOP: Conversions

44 ANS: 3

$3\sqrt{2} + \sqrt{8} = 3\sqrt{2} + \sqrt{4}\sqrt{2} = 3\sqrt{2} + 2\sqrt{2} = 5\sqrt{2}$

PTS: 2 REF: 011121ia STA: A.N.3 TOP: Operations with Radicals
KEY: addition

45 ANS:

$y = \frac{3}{4}x + 10$. $y = mx + b$

$4 = \frac{3}{4}(-8) + b$

$4 = -6 + b$

$10 = b$

PTS: 3 REF: 011134ia STA: A.A.34 TOP: Writing Linear Equations

46 ANS: 2 PTS: 2 REF: 010916ia STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

47 ANS: 2 PTS: 2 REF: 061122ia STA: A.S.14
TOP: Analysis of Data

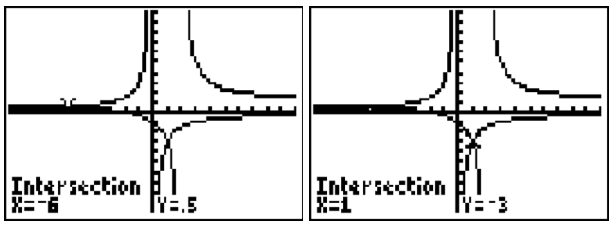
48 ANS: 4

$SA = 2lw + 2hw + 2lh = 2(2)(3) + 2(4)(3) + 2(2)(4) = 52$

PTS: 2 REF: 011029ia STA: A.G.2 TOP: Surface Area

49 ANS: 2 PTS: 2 REF: 010909ia STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

50 ANS: 4



$$\frac{x+2}{x-2} = \frac{-3}{x}$$

$$x(x+2) = -3(x-2)$$

$$x^2 + 2x = -3x + 6$$

$$x^2 + 5x - 6 = 0$$

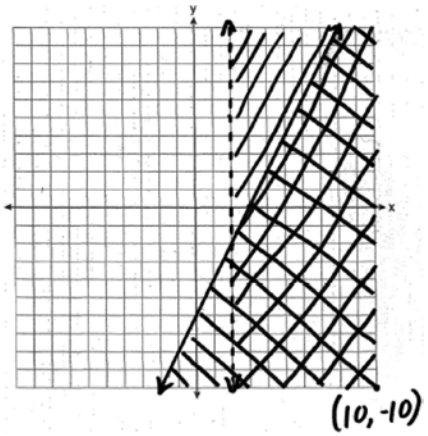
$$(x+6)(x-1) = 0$$

$$x = -6 \text{ or } 1$$

PTS: 2 REF: 011028ia STA: A.A.26 TOP: Solving Rationals

51 ANS: 2 PTS: 2 REF: 061027ia STA: A.A.20
TOP: Factoring Polynomials

52 ANS:



PTS: 4 REF: 010938ia STA: A.G.7 TOP: Systems of Linear Inequalities

53 ANS: 3

$3\sqrt{250} = 3\sqrt{25}\sqrt{10} = 15\sqrt{10}$

PTS: 2 REF: 061106ia STA: A.N.2 TOP: Simplifying Radicals

54 ANS: 1 PTS: 2 REF: 061024ia STA: A.A.17
TOP: Addition and Subtraction of Rationals

55 ANS: 4 PTS: 2 REF: fall0715ia STA: A.A.5
TOP: Modeling Inequalities

56 ANS: 2 PTS: 2 REF: 061128ia STA: A.A.29
TOP: Set Theory

57 ANS: 2 PTS: 2 REF: 010915ia STA: A.A.5
TOP: Modeling Equations

58 ANS: 4 PTS: 2 REF: 011111ia STA: A.G.8
TOP: Solving Quadratics by Graphing

59 ANS: 3

$$\frac{(12.3 \times 11.9) - (12.2 \times 11.8)}{12.3 \times 11.9} \approx 0.0165$$

PTS: 2 REF: 061120ia STA: A.M.3 TOP: Error
KEY: area

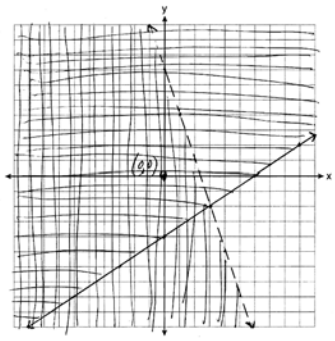
60 ANS: 3
Frequency is not a variable.

PTS: 2 REF: 011014ia STA: A.S.2 TOP: Analysis of Data

61 ANS: 2 PTS: 2 REF: 061121ia STA: A.A.3
TOP: Expressions

62 ANS: 3 PTS: 2 REF: fall0705ia STA: A.N.1
TOP: Identifying Properties

63 ANS:



PTS: 4 REF: 061139ia STA: A.G.7 TOP: Systems of Linear Inequalities

64 ANS:
30, 20, 71-80, 81-90 and 91-100

PTS: 4 REF: 061038ia STA: A.S.9
TOP: Frequency Histograms, Bar Graphs and Tables

65 ANS: 1

$$\frac{2}{x} - 3 = \frac{26}{x}$$

$$-3 = \frac{24}{x}$$

$$x = -8$$

PTS: 2 REF: 010918ia STA: A.A.26 TOP: Solving Rationals

66 ANS: 2

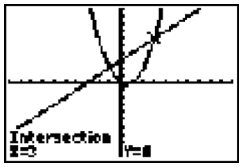
$$20000(.88)^3 = 13629.44$$

PTS: 2 REF: 061124ia STA: A.A.9 TOP: Exponential Functions

67 ANS: 2
The median score, 10, is the vertical line in the center of the box.

PTS: 2 REF: fall0709ia STA: A.S.5 TOP: Box-and-Whisker Plots

68 ANS: 2



$x^2 - x = x + 3$. Since $y = x + 3$, the solutions are $(3,6)$ and $(-1,2)$.

$x^2 - 2x - 3 = 0$

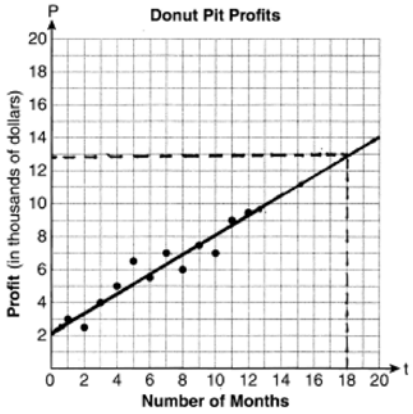
$(x - 3)(x + 1) = 0$

$x = 3 \text{ or } -1$

PTS: 2 REF: 061118ia STA: A.A.11 TOP: Quadratic-Linear Systems

69 ANS: 1 PTS: 2 REF: 010905ia STA: A.G.4
TOP: Families of Functions

70 ANS:



They will not reach their goal in 18 months.

PTS: 3 REF: 061036ia STA: A.S.17 TOP: Scatter Plots

71 ANS:
6, 8, 10. Three consecutive even integers are x, $x + 2$ and $x + 4$. $(x + 2)(x + 4) = 10x + 20$

$x^2 + 6x + 8 = 10x + 20$

$x^2 - 4x - 12 = 0$

$(x - 6)(x + 2) = 0$

$x = 6$

PTS: 4 REF: 011039ia STA: A.A.8 TOP: Writing Quadratics

72 ANS: 4

$\frac{ey}{n} + k = t$

$\frac{ey}{n} = t - k$

$y = \frac{n(t-k)}{e}$

PTS: 2 REF: 011125ia STA: A.A.23 TOP: Transforming Formulas

73 ANS: 2

$A = lw + lw + \frac{\pi r^2}{4} = 5 \cdot 3 + 5 \cdot 3 + \frac{\pi \cdot 3^2}{4} \approx 37$

PTS: 2 REF: 011123ia STA: A.G.1 TOP: Compositions of Polygons and Circles
KEY: area

74 ANS: 4 PTS: 2 REF: 061028ia STA: A.G.6
TOP: Linear Inequalities

75 ANS: 1

$\frac{1}{8} \times \frac{1}{8} = \frac{1}{64}$

PTS: 2 REF: 010928ia STA: A.S.23 TOP: Geometric Probability

76 ANS:

$x = 1;\ (1, -5)$

PTS: 2 REF: 061133ia STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

77 ANS:

81.3, 80, both increase

PTS: 3 REF: 011035ia STA: A.S.16 TOP: Central Tendency

78 ANS: 4 PTS: 2 REF: 010908ia STA: A.A.9
TOP: Exponential Functions

79 ANS: 3

$P(odd) = \frac{3}{6}, P(prime) = \frac{3}{6}, P(perfect\ square) = \frac{2}{6}, P(even) = \frac{3}{6}$

PTS: 2 REF: 061104ia STA: A.S.22 TOP: Geometric Probability

80 ANS: 2

$m = \frac{5-2}{3-(-2)} = \frac{3}{5}$

PTS: 2 REF: 061004ia STA: A.A.33 TOP: Slope

81 ANS:
16. 12 feet equals 4 yards. $4 \times 4 = 16$.

PTS: 2 REF: 011031ia STA: A.M.2 TOP: Conversions

82 ANS: 4 PTS: 2 REF: 010927ia STA: A.N.4
TOP: Operations with Scientific Notation

83 ANS: 3 PTS: 2 REF: fall0706ia STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

84 ANS: 1
A rooster crows before sunrise, not because of the sun.

PTS: 2 REF: fall0707ia STA: A.S.14 TOP: Analysis of Data

85 ANS: 1

$$\frac{2x}{3} + \frac{1}{2} = \frac{5}{6}$$

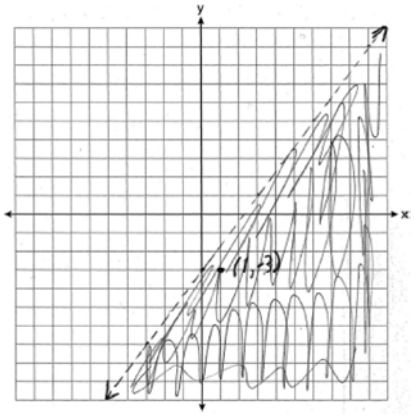
$$\frac{2x}{3} = \frac{1}{3}$$

$$6x = 3$$

$$x = \frac{1}{2}$$

PTS: 2 REF: 011112ia STA: A.A.25
TOP: Solving Equations with Fractional Expressions

86 ANS:



(1,–3) is in the solution set. $4(1) - 3(-3) > 9$

$4 + 9 > 9$

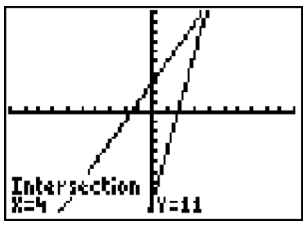
PTS: 4 REF: 011038ia STA: A.G.6 TOP: Linear Inequalities

87 ANS: 3 PTS: 2 REF: 061119ia STA: A.A.2
TOP: Expressions

88 ANS: 1 PTS: 2 REF: 061010ia STA: A.A.40
TOP: Systems of Linear Inequalities

89 ANS:

4. $3 + 2g = 5g - 9$



$12 = 3g$

$g = 4$

PTS: 2 REF: fall0732ia STA: A.A.22 TOP: Solving Equations

90 ANS: 1

$4y - 2x = 0$

$4(-1) - 2(-2) = 0$

$-4 + 4 = 0$

PTS: 2 REF: 011021ia STA: A.A.39 TOP: Identifying Points on a Line

91 ANS:

4,–5. $\frac{x+2}{6} = \frac{3}{x-1}$

$(x+2)(x-1) = 18$

$x^2 - x + 2x - 2 = 18$

$x^2 + x - 20 = 0$

$(x+5)(x-4) = 0$

$x = -5 \text{ or } 4$

PTS: 3 REF: 011136ia STA: A.A.26 TOP: Solving Rationals

92 ANS: 1

$\sin x = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{28}{53}$

PTS: 2 REF: 011109ia STA: A.A.42 TOP: Trigonometric Ratios

93 ANS: 1 PTS: 2 REF: 011001ia STA: A.S.6
TOP: Box-and-Whisker Plots

94 ANS:

$30\sqrt{2}$. $5\sqrt{72} = 5\sqrt{36}\sqrt{2} = 30\sqrt{2}$

PTS: 2 REF: fall0731ia STA: A.N.2 TOP: Simplifying Radicals

95 ANS: 3 PTS: 2 REF: 011117ia STA: A.G.4
TOP: Graphing Absolute Value Functions

96 ANS:

$0.65x + 35 \le 45$

$0.65x \le 10$

$x \le 15$

PTS: 3 REF: 061135ia STA: A.A.6 TOP: Modeling Inequalities

97 ANS: 2

$m = \frac{5-3}{2-7} = -\frac{2}{5}$

PTS: 2 REF: 010913ia STA: A.A.33 TOP: Slope

98 ANS: 3 PTS: 2 REF: fall0702ia STA: A.S.23
TOP: Theoretical Probability KEY: mutually exclusive events

99 ANS: 1 PTS: 2 REF: 061103ia STA: A.A.12
TOP: Division of Powers

100 ANS: 4 PTS: 2 REF: 011102ia STA: A.G.9
TOP: Quadratic-Linear Systems

101 ANS:

$\frac{1375}{1600}$. $\frac{40^2 - 15^2}{40^2} = \frac{1375}{1600}$

PTS: 2 REF: 011132ia STA: A.S.20 TOP: Geometric Probability

102 ANS: 1

Asking school district employees about a school board candidate produces the most bias.

PTS: 2 REF: 061107ia STA: A.S.3 TOP: Analysis of Data

103 ANS: 3 PTS: 2 REF: fall0710ia STA: A.A.31
TOP: Set Theory

104 ANS: 3 PTS: 2 REF: 061017ia STA: A.S.11
TOP: Quartiles and Percentiles

105 ANS: 1

$15000(1.2)^{\frac{6}{3}} = 21,600.\ 21,600 - 15,000 = 6,600$

PTS: 2 REF: 061030ia STA: A.A.9 TOP: Exponential Functions

106 ANS: 4

$\frac{(d \times 3) + (2 \times 2d)}{2 \times 3} = \frac{3d + 4d}{6} = \frac{7d}{6}$

PTS: 2 REF: fall0727ia STA: A.A.17 TOP: Addition and Subtraction of Rationals

107 ANS: 2

$\sin 57 = \frac{x}{8}$

$x \approx 6.7$

PTS: 2 REF: 061108ia STA: A.A.44 TOP: Using Trigonometry to Find a Side

108 ANS: 1 PTS: 2 REF: 011126ia STA: A.A.13
TOP: Addition and Subtraction of Polynomials KEY: subtraction

109 ANS: 2

$\frac{9x^4 - 27x^6}{3x^3} = \frac{9x^4(1 - 3x^2)}{3x^3} = 3x(1 - 3x^2)$

PTS: 2 REF: fall0718ia STA: A.A.16 TOP: Rational Expressions
KEY: a > 0

110 ANS:

33.4. Serena needs 24 $(9 + 6 + 9)$ feet of fencing to surround the rectangular portion of the garden. The length of the fencing needed for the semicircular portion of the garden is $\frac{1}{2}\pi d = 3\pi \approx 9.4$ feet.

PTS: 2 REF: fall0733ia STA: A.G.1 TOP: Compositions of Polygons and Circles
KEY: perimeter

111 ANS: 2

$y - kx = 7$ may be rewritten as $y = kx + 7$

PTS: 2 REF: 061015ia STA: A.A.38 TOP: Parallel and Perpendicular Lines

112 ANS: 4

$x^2 - 4x - 12 = 0$

$(x - 6)(x + 2) = 0$

$x = 6 \; x = -2$

PTS: 2 REF: 061125ia STA: A.A.15 TOP: Undefined Rationals

113 ANS: 4

The transformation is a reflection in the x-axis.

PTS: 2 REF: fall0722ia STA: A.G.5 TOP: Graphing Absolute Value Functions

114 ANS: 3

2(1)+3=5

PTS: 2 REF: 061007ia STA: A.A.39 TOP: Linear Equations

115 ANS: 3

$x^2 - 10x + 21 = 0$

$(x - 7)(x - 3) = 0$

$x = 7 \quad x = 3$

PTS: 2 REF: 010914ia STA: A.A.28 TOP: Roots of Quadratics

116 ANS: 2

$\sin U = \dfrac{\text{opposite}}{\text{hypotenuse}} = \dfrac{15}{17}$

PTS: 2 REF: 010919ia STA: A.A.42 TOP: Trigonometric Ratios

117 ANS: 3

$\sqrt{72} = \sqrt{36}\sqrt{2} = 6\sqrt{2}$

PTS: 2 REF: 010920ia STA: A.N.2 TOP: Simplifying Radicals

118 ANS: 3 PTS: 2 REF: 010910ia STA: A.A.35
TOP: Writing Linear Equations

119 ANS: 3

$\dfrac{(2x^3)(8x^5)}{4x^6} = \dfrac{16x^8}{4x^6} = 4x^2$

PTS: 2 REF: fall0703ia STA: A.A.12 TOP: Division of Powers

120 ANS: 4

$5 \times 2 \times 3 = 30$

PTS: 2 REF: 061002ia STA: A.N.7 TOP: Multiplication Counting Principle

121 ANS:

$\dfrac{38}{\pi}$, 2. $V = \pi r^2 h$. $\dfrac{36}{\left(\dfrac{38}{\pi}\right)} \approx 2.97$. Three cans will not fit. The maximum number is 2.

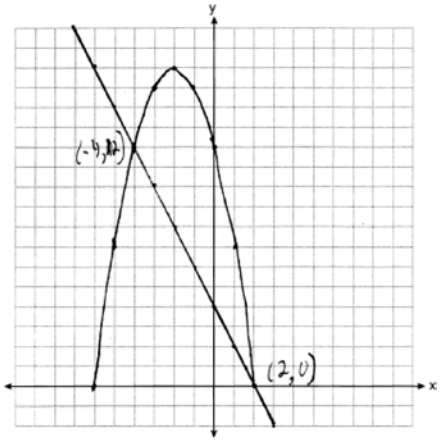
$342 = \pi\left(\dfrac{6}{2}\right)^2 h$

$\dfrac{342}{9\pi} = h$

$\dfrac{38}{\pi} = h$

PTS: 3 REF: 010936ia STA: A.G.2 TOP: Volume

122 ANS:



PTS: 4 REF: 061039ia STA: A.G.9 TOP: Quadratic-Linear Systems

123 ANS: 1

$f + m = 53$

$f - m = 25$

$2m = 28$

$m = 14$

PTS: 2 REF: 061126ia STA: A.A.7 TOP: Writing Linear Systems

124 ANS:

0.029. $\dfrac{[2\pi(5.1)^2 + 2\pi(5.1)(15.1)] - [2\pi(5)^2 + 2\pi(5)(15)]}{2\pi(5.1)^2 + 2\pi(5.1)(15.1)} \approx \dfrac{647.294 - 628.319}{647.294} \approx 0.029$

PTS: 4 REF: 011137ia STA: A.M.3 TOP: Error
KEY: volume and surface area

125 ANS: 4 PTS: 2 REF: 011114ia STA: A.N.1
TOP: Properties of Reals

126 ANS: 3

$m = \dfrac{4 - 10}{3 - (-6)} = -\dfrac{2}{3}$

PTS: 2 REF: fall0716ia STA: A.A.33 TOP: Slope

127 ANS: 4

The mean is $80.\overline{6}$, the median is 84.5 and the mode is 87.

PTS: 2 REF: 010907ia STA: A.S.4 TOP: Central Tendency

128 ANS:

2.1. $\cos 65 = \frac{x}{5}$

$x \approx 2.1$

PTS: 2 REF: 011133ia STA: A.A.44 TOP: Using Trigonometry to Find a Side

129 ANS: 2 PTS: 2 REF: 061127ia STA: A.N.4
TOP: Operations with Scientific Notation

130 ANS: 1

$1P + 2C = 5$

$1P + 4C = 6$

$2C = 1$

$C = 0.5$

PTS: 2 REF: 011003ia STA: A.A.7 TOP: Writing Linear Systems

131 ANS:

$-6a + 42$. distributive

PTS: 2 REF: 061032ia STA: A.N.1 TOP: Properties of Reals

132 ANS: 3

The age of a child does not cause the number of siblings he has, or vice versa.

PTS: 2 REF: 011030ia STA: A.S.14 TOP: Analysis of Data

133 ANS: 4

$\frac{7}{12x} - \frac{y}{6x^2} = \frac{42x^2 - 12xy}{72x^3} = \frac{6x(7x - 2y)}{72x^3} = \frac{7x - 2y}{12x^2}$

PTS: 2 REF: 061129ia STA: A.A.17 TOP: Addition and Subtraction of Rationals

134 ANS: 1

The slope of $2x - 4y = 16$ is $\frac{-A}{B} = \frac{-2}{-4} = \frac{1}{2}$

PTS: 2 REF: 011026ia STA: A.A.38 TOP: Parallel and Perpendicular Lines

135 ANS: 2 PTS: 2 REF: 061113ia STA: A.G.5
TOP: Graphing Quadratic Functions

136 ANS: 1

$\sin C = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{13}{85}$

PTS: 2 REF: fall0721ia STA: A.A.42 TOP: Trigonometric Ratios

137 ANS: 4

${}_8P_3 = 336$

PTS: 2 REF: 061026ia STA: A.N.8 TOP: Permutations

138 ANS: 3 PTS: 2 REF: 010917ia STA: A.A.29
TOP: Set Theory

139 ANS:

orchestra: $\frac{3}{26} > \frac{4}{36}$

PTS: 2 REF: 011033ia STA: A.S.22 TOP: Theoretical Probability

140 ANS: 2

Debbie failed to distribute the 3 properly.

PTS: 2 REF: 011009ia STA: A.A.22 TOP: Solving Equations

141 ANS: 2

$$\frac{3}{2x} + \frac{7}{4x} = \frac{12x + 14x}{8x^2} = \frac{26x}{8x^2} = \frac{13}{4x}$$

PTS: 2 REF: 011120ia STA: A.A.17 TOP: Addition and Subtraction of Rationals

142 ANS: 2 PTS: 2 REF: 011023ia STA: A.A.40
TOP: Systems of Linear Inequalities

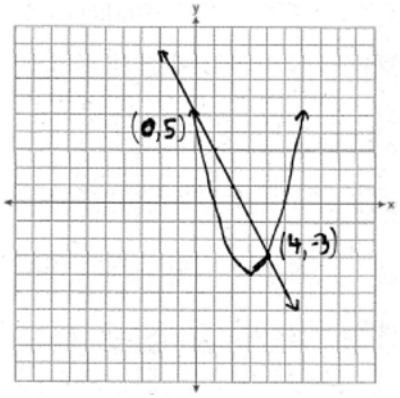
143 ANS:

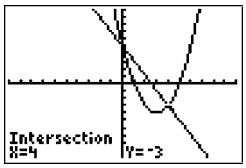
225000, 175000, the median better represents the value since it is closer to more values than the mean.

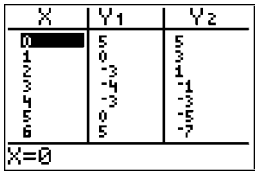
PTS: 4 REF: fall0737ia STA: A.S.4
TOP: Frequency Histograms, Bar Graphs and Tables

144 ANS: 2 PTS: 2 REF: fall0701ia STA: A.S.7
TOP: Scatter Plots

145 ANS:







PTS: 4 REF: fall0738ia STA: A.G.9 TOP: Quadratic-Linear Systems

146 ANS:

–12. $3\left(\frac{2}{3}x + 3 < -2x - 7\right)$

$x + 9 < -6x - 21$

$7x < -30$

$x < \frac{-30}{7}$

PTS: 3 REF: 061034ia STA: A.A.21 TOP: Interpreting Solutions

147 ANS:

12, 7. Both the median and the mode will increase.

PTS: 3 REF: 061134ia STA: A.S.16 TOP: Central Tendency

148 ANS: 2 PTS: 2 REF: 061105ia STA: A.A.20
TOP: Factoring Polynomials

149 ANS:

$\sin x = \frac{30}{50}$

$x = \sin^{-1}\frac{3}{5}$

$x \approx 37$

PTS: 2 REF: 061033ia STA: A.A.43 TOP: Using Trigonometry to Find an Angle

150 ANS: 3

$10^2 + 10^2 = c^2$

$c^2 = 200$

$c \approx 14.1$

PTS: 2 REF: 061102ia STA: A.A.45 TOP: Pythagorean Theorem

151 ANS: 4

${}_5P_5 = 5 \times 4 \times 3 \times 2 \times 1 = 120$

PTS: 2 REF: 061109ia STA: A.N.8 TOP: Permutations

152 ANS: 4 PTS: 2 REF: 061123ia STA: A.A.31
TOP: Set Theory

153 ANS: 3 PTS: 2 REF: 061003ia STA: A.A.13
TOP: Addition and Subtraction of Polynomials KEY: addition

154 ANS:

(S,S), (S,K), **(S,D)**, (K,S), (K,K), **(K,D)**, **(D,S)**, **(D,K)**, (D,D), $\frac{4}{9}$

PTS: 3 REF: fall0736ia STA: A.S.19 TOP: Sample Space

155 ANS: 3

$m = \dfrac{6-4}{3-(-2)} = \dfrac{2}{5}$

PTS: 2 REF: 061110ia STA: A.A.33 TOP: Slope

156 ANS: 4 PTS: 2 REF: 061022ia STA: A.S.3
TOP: Analysis of Data

157 ANS:

50, 1.5, 10. $\dfrac{\text{distance}}{\text{time}} = \dfrac{60}{1.2} = 50.$ $\dfrac{\text{distance}}{\text{time}} = \dfrac{60}{40} = 1.5.$ speed $\times$ time $= 55 \times 2 = 110.$ $120 - 110 = 10$

PTS: 3 REF: fall0734ia STA: A.M.1 TOP: Speed

158 ANS: 3 PTS: 2 REF: 061011ia STA: A.S.2
TOP: Analysis of Data

159 ANS: 4 PTS: 2 REF: 061111ia STA: A.G.4
TOP: Families of Functions

160 ANS: 4

$A(-3,4)$ and $B(5,8)$. $m = \dfrac{4-8}{-3-5} = \dfrac{-4}{-8} = \dfrac{1}{2}$

PTS: 2 REF: 011007ia STA: A.A.33 TOP: Slope

161 ANS: 2

$x^2 - 2x - 15 = 0$

$(x-5)(x+3) = 0$

$x = 5 \quad x = -3$

PTS: 2 REF: 011128ia STA: A.A.28 TOP: Roots of Quadratics

162 ANS: 4

$w(w+5) = 36$

$w^2 + 5w - 36 = 0$

PTS: 2 REF: fall0726ia STA: A.A.5 TOP: Modeling Equations

163 ANS: 1

Everyone eats, can shop in malls and wear clothes. People who work in a sporting goods store probably watch more sports television than most.

PTS: 2 REF: 010923ia STA: A.S.3 TOP: Analysis of Data

164 ANS: 1

The slope of $y = 3 - 2x$ is -2. Using $m = -\dfrac{A}{B}$, the slope of $4x + 2y = 5$ is $-\dfrac{4}{2} = -2$.

PTS: 2 REF: 010926ia STA: A.A.38 TOP: Parallel and Perpendicular Lines

165 ANS: 2 PTS: 2 REF: 011019ia STA: A.S.12
TOP: Scatter Plots

166 ANS: 3

$\cos 30 = \frac{x}{24}$

$x \approx 21$

PTS: 2 REF: 010912ia STA: A.A.44 TOP: Using Trigonometry to Find a Side

167 ANS: 1 PTS: 2 REF: 061005ia STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

168 ANS: 4 PTS: 2 REF: 061013ia STA: A.G.3
TOP: Defining Functions

169 ANS: 4 PTS: 2 REF: 011020ia STA: A.A.12
TOP: Multiplication of Powers

170 ANS: 4 PTS: 2 REF: 011116ia STA: A.S.1
TOP: Analysis of Data

171 ANS:
(1) Distributive; (2) Commutative

PTS: 2 REF: 061132ia STA: A.N.1 TOP: Identifying Properties

172 ANS:

$\frac{3}{4x-8} \cdot \frac{3x+6}{4x+12} \div \frac{x^2-4}{x+3} = \frac{3(x+2)}{4(x+3)} \cdot \frac{x+3}{(x+2)(x-2)} = \frac{3}{4(x-2)}$

PTS: 3 REF: 010935ia STA: A.A.18 TOP: Multiplication and Division of Rationals

173 ANS: 2

$A = lw + \frac{\pi r^2}{2} = 6 \cdot 5 + \frac{\pi \cdot 3^2}{2} \approx 44.1$

PTS: 2 REF: 061029ia STA: A.G.1 TOP: Compositions of Polygons and Circles
KEY: area

174 ANS: 2

$\tan A = \frac{\text{opposite}}{\text{adjacent}} = \frac{14}{48}$

PTS: 2 REF: 061009ia STA: A.A.42 TOP: Trigonometric Ratios

175 ANS: 1

$x^2 - 36 = 5x$

$x^2 - 5x - 36 = 0$

$(x-9)(x+4) = 0$

$x = 9$

PTS: 2 REF: 061020ia STA: A.A.8 TOP: Writing Quadratics

176 ANS: 2
$R = 0.5^{d-1}$

PTS: 2 REF: 011006ia STA: A.A.9 TOP: Exponential Functions
177 ANS: 4
In (4), each element in the domain corresponds to a unique element in the range.

PTS: 2 REF: 011018ia STA: A.G.3 TOP: Defining Functions
178 ANS: 2 PTS: 2 REF: fall0725ia STA: A.N.4
TOP: Operations with Scientific Notation
179 ANS: 1 PTS: 2 REF: fall0728ia STA: A.A.15
TOP: Undefined Rationals
180 ANS: 2
The slope of the inequality is $-\frac{1}{2}$.

PTS: 2 REF: fall0720ia STA: A.G.6 TOP: Linear Inequalities
181 ANS:
24,435.19. $30000(.95)^4 \approx 24435.19$

PTS: 4 REF: 011138ia STA: A.A.9 TOP: Exponential Functions
182 ANS: 3

$$\frac{x}{3} + \frac{x+1}{2} = x$$

$$\frac{2x + 3(x+1)}{6} = x$$

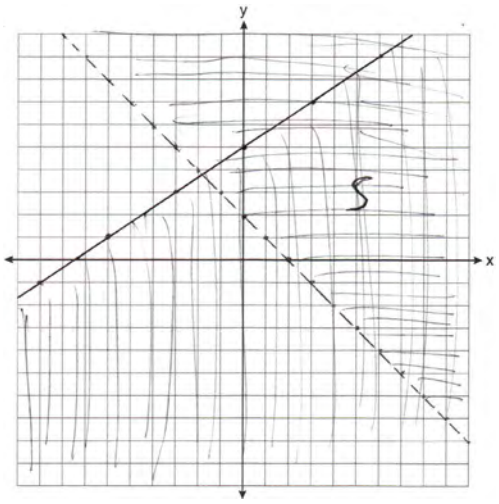
$$5x + 3 = 6x$$

$$3 = x$$

PTS: 2 REF: 061019ia STA: A.A.25
TOP: Solving Equations with Fractional Expressions
183 ANS:
1,512, 1,551.25, 0.025. $36 \times 42 = 1512$. $36.5 \times 42.5 = 1551.25$. $RE = \left|\frac{1512 - 1551.25}{1551.25}\right| \approx 0.025$.

PTS: 3 REF: 010934ia STA: A.M.3 TOP: Error
KEY: area
184 ANS: 2 PTS: 2 REF: 011015ia STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

185 ANS:



PTS: 4 REF: 011139ia STA: A.G.7 TOP: Systems of Linear Inequalities

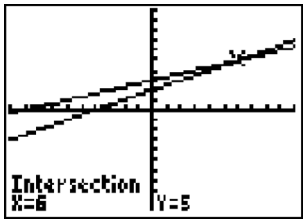
186 ANS: 3

$\sqrt{72} - 3\sqrt{2} = \sqrt{36}\sqrt{2} - 3\sqrt{2} = 6\sqrt{2} - 3\sqrt{2} = 3\sqrt{2}$

PTS: 2 REF: 061008ia STA: A.N.3 TOP: Operations with Radicals

KEY: subtraction

187 ANS: 3



$\frac{k+4}{2} = \frac{k+9}{3}$

$3(k+4) = 2(k+9)$

$3k + 12 = 2k + 18$

$k = 6$

PTS: 2 REF: 010906ia STA: A.A.26 TOP: Solving Rationals

188 ANS:

$2(x+3)(x-4) + 2(5)(x-4) + 2(x+3)(5)$

$2(x^2 - 4x + 3x - 12) + 10(x-4) + 10(x+3)$

$2x^2 - 2x - 24 + 10x - 40 + 10x + 30$

$2x^2 + 18x - 34$

PTS: 3 REF: 061136ia STA: A.G.2 TOP: Surface Area

189 ANS: 3

$$\frac{15}{15+13+12} = \frac{15}{40} = \frac{3}{8}$$

PTS: 2 REF: 061006ia STA: A.S.21 TOP: Experimental Probability

190 ANS: 4 PTS: 2 REF: fall0729ia STA: A.A.2
TOP: Expressions

191 ANS: 4 PTS: 2 REF: 010930ia STA: A.G.3
TOP: Defining Functions

192 ANS: 4 PTS: 2 REF: 061016ia STA: A.A.2
TOP: Expressions

193 ANS:

0.102. $\frac{(5.3 \times 8.2 \times 4.1) - (5 \times 8 \times 4)}{5.3 \times 8.2 \times 4.1} = \frac{178.16 - 160}{178.16} = 0.102$

PTS: 3 REF: 011036ia STA: A.M.3 TOP: Error
KEY: volume and surface area

194 ANS: 3

$$\frac{3+2+4+3}{20} = \frac{12}{20}$$

PTS: 2 REF: 011129ia STA: A.S.21 TOP: Experimental Probability

195 ANS:

(H,F,M), (H,F,J), (H,F,S), (H,A,M), (H,A,J), (H,A,S), (C,F,M), (C,F,J), (C,F,S), (C,A,M), (C,A,J), (C,A,S), (T,F,M), (T,F,J), (T,F,S), (T,A,M), (T,A,J), (T,A,S). There are 18 different kids' meals, 12 do not include juice and 6 include chicken nuggets.

PTS: 4 REF: 010939ia STA: A.S.19 TOP: Sample Space

196 ANS:

7. $15x + 22 \geq 120$

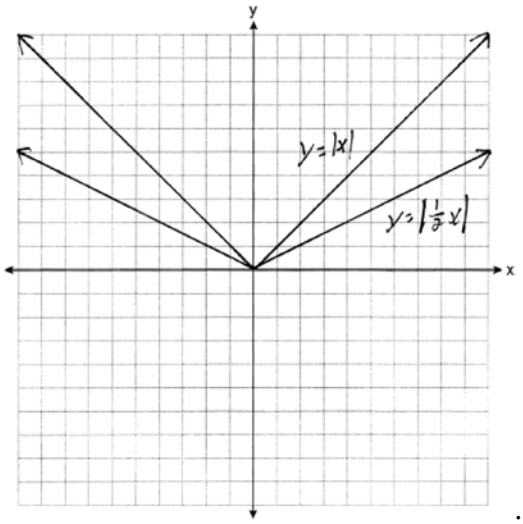
$$x \geq 6.5\overline{3}$$

PTS: 3 REF: fall0735ia STA: A.A.6 TOP: Modeling Inequalities

197 ANS: 4 PTS: 2 REF: 061018ia STA: A.A.12
TOP: Division of Powers

198 ANS: 4 PTS: 2 REF: 011016ia STA: A.A.23
TOP: Transforming Formulas

199 ANS:



. Graph becomes wider as the coefficient approaches 0.

PTS: 3 REF: 061035ia STA: A.G.5 TOP: Graphing Absolute Value Functions

200 ANS: 3

mean = $81\frac{7}{11}$, median = 81 and mode = 76

PTS: 2 REF: 011118ia STA: A.S.4 TOP: Central Tendency

201 ANS: 4

In (4), each element in the domain corresponds to a unique element in the range.

PTS: 2 REF: 011105ia STA: A.G.3 TOP: Defining Functions

202 ANS: 3

$75 - 15 = 60$

PTS: 2 REF: 011113ia STA: A.S.6 TOP: Box-and-Whisker Plots

203 ANS: 4 PTS: 2 REF: fall0717ia STA: A.G.4

TOP: Families of Functions

204 ANS: 2

$a^3 - 4a = a(a^2 - 4) = a(a-2)(a+2)$

PTS: 2 REF: 011108ia STA: A.A.19

TOP: Factoring the Difference of Perfect Squares

205 ANS: 2

The two values are shoe size and height.

PTS: 2 REF: fall0714ia STA: A.S.2 TOP: Analysis of Data

206 ANS: 2 PTS: 2 REF: 061115ia STA: A.S.7

TOP: Scatter Plots

207 ANS:

–2, 3. $x^2 - x = 6$

$x^2 - x - 6 = 0$

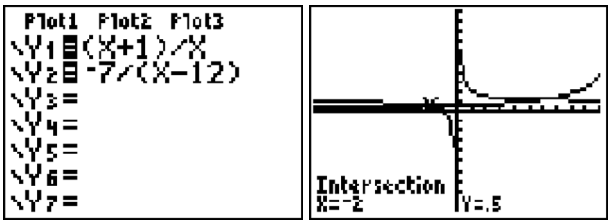
$(x-3)(x+2) = 0$

$x = 3 \text{ or } -2$

PTS: 3 REF: 011034ia STA: A.A.28 TOP: Roots of Quadratics

208 ANS:

6, –2. $\frac{x+1}{x} = \frac{-7}{x-12}$



$(x+1)(x-12) = -7x$

$x^2 - 11x - 12 = -7x$

$x^2 - 4x - 12 = 0$

$(x-6)(x+2) = 0$

$x = 6 \text{ or } -2$

PTS: 4 REF: fall0739ia STA: A.A.26 TOP: Solving Rationals

209 ANS: 4 PTS: 2 REF: 061001ia STA: A.A.30
TOP: Set Theory

210 ANS: 4

$P(O) = \frac{3}{6}, P(E) = \frac{3}{6}, P(< 6) = \frac{5}{6}, P(> 4) = \frac{2}{6}$

PTS: 2 REF: 010903ia STA: A.S.22 TOP: Theoretical Probability

211 ANS: 3 PTS: 2 REF: 011104ia STA: A.A.1
TOP: Expressions

212 ANS: 4 PTS: 2 REF: fall0730ia STA: A.G.3
TOP: Defining Functions

213 ANS:

(–2, 5). $3x + 2y = 4$ $12x + 8y = 16.$ $3x + 2y = 4$

$4x + 3y = 7$ $12x + 9y = 21$ $3x + 2(5) = 4$

$y = 5$ $3x = -6$

$x = -2$

PTS: 4 REF: 010937ia STA: A.A.10 TOP: Solving Linear Systems

214 ANS: 2 PTS: 2 REF: 011027ia STA: A.A.3
TOP: Expressions

215 ANS: 1

$$\frac{x^2 - x - 6}{x^2 - 5x + 6} = \frac{(x-3)(x+2)}{(x-3)(x+2)} = \frac{x+2}{x-2}$$

PTS: 2 REF: 011130ia STA: A.A.16 TOP: Rational Expressions
KEY: a > 0

216 ANS: 3

$$\cos A = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{15}{17}$$

PTS: 2 REF: 011008ia STA: A.A.42 TOP: Trigonometric Ratios

217 ANS: 2 PTS: 2 REF: 061023ia STA: A.A.23
TOP: Transforming Formulas

218 ANS: 2 PTS: 2 REF: 011002ia STA: A.S.20
TOP: Theoretical Probability

219 ANS: 4 PTS: 2 REF: 011025ia STA: A.A.17
TOP: Addition and Subtraction of Rationals

220 ANS: 3 PTS: 2 REF: 011017ia STA: A.G.5
TOP: Graphing Absolute Value Functions

221 ANS: 4

$$\frac{\text{distance}}{\text{time}} = \frac{24}{6} = 4$$

PTS: 2 REF: 010902ia STA: A.M.1 TOP: Speed

222 ANS: 1

$$-2x + 5 > 17$$

$$-2x > 12$$

$$x < -6$$

PTS: 2 REF: fall0724ia STA: A.A.21 TOP: Interpreting Solutions

223 ANS: 3 PTS: 2 REF: 011103ia STA: A.S.12
TOP: Scatter Plots

224 ANS: 1 PTS: 2 REF: 011004ia STA: A.A.31
TOP: Set Theory

225 ANS: 1

$30^2 + 40^2 = c^2$. 30, 40, 50 is a multiple of 3, 4, 5.

$$2500 = c^2$$

$$50 = c$$

PTS: 2 REF: fall0711ia STA: A.A.45 TOP: Pythagorean Theorem

226 ANS: 1

$x = \dfrac{-b}{2a} = \dfrac{-6}{2(-1)} = 3.$

PTS: 2 REF: 011127ia STA: A.A.41
TOP: Identifying the Vertex of a Quadratic Given Equation

227 ANS: 1

$\dfrac{12.8 + 17.2}{3 + 5} = 3.75$

PTS: 2 REF: 061117ia STA: A.M.1 TOP: Speed

228 ANS: 3

$35000(1 - 0.05)^4 \approx 28507.72$

PTS: 2 REF: fall0719ia STA: A.A.9 TOP: Exponential Functions

229 ANS: 1 PTS: 2 REF: fall0723ia STA: A.M.3
TOP: Error KEY: area

230 ANS: 1

$m = \dfrac{3 - 0}{0 - 2} = -\dfrac{3}{2}$. Using the given y-intercept $(0, 3)$ to write the equation of the line $y = -\dfrac{3}{2}x + 3$.

PTS: 2 REF: fall0713ia STA: A.A.35 TOP: Writing Linear Equations

231 ANS: 1

$0.07m + 19 \le 29.50$

$0.07m \le 10.50$

$m \le 150$

PTS: 2 REF: 010904ia STA: A.A.6 TOP: Modeling Inequalities

232 ANS: 2

$\sqrt{18.4^2 - 7^2} \approx 17$

PTS: 2 REF: 011107ia STA: A.A.45 TOP: Pythagorean Theorem

233 ANS: 4

$s = \dfrac{d}{t} = \dfrac{150\text{ m}}{1.5\text{ min}} \cdot \dfrac{60\text{ min}}{1\text{ hr}} = 6{,}000\,\dfrac{\text{m}}{\text{hr}}$

PTS: 2 REF: 061025ia STA: A.M.1 TOP: Speed

234 ANS: 2

$m = \dfrac{-A}{B} = \dfrac{-3}{-7} = \dfrac{3}{7}$

PTS: 2 REF: 011122ia STA: A.A.37 TOP: Slope

Integrated Algebra Regents at Random
Answer Section

235 ANS: 3 PTS: 2 REF: 060817ia STA: A.A.15
TOP: Undefined Rationals

236 ANS: 3
The number of correct answers on a test causes the test score.

PTS: 2 REF: 080908ia STA: A.S.13 TOP: Analysis of Data

237 ANS: 4

$$\frac{x}{x+4} \div \frac{2x}{x^2-16} = \frac{x}{x+4} \cdot \frac{x^2-16}{2x} = \frac{1}{x+4} \cdot \frac{(x+4)(x-4)}{2} = \frac{x-4}{2}$$

PTS: 2 REF: 081130ia STA: A.A.18 TOP: Multiplication and Division of Rationals

238 ANS: 2

$$L + S = 47$$
$$L - S = 15$$
$$2L = 62$$
$$L = 31$$

PTS: 2 REF: 060912ia STA: A.A.7 TOP: Writing Linear Systems

239 ANS: 1

$$8^2 + 15^2 = c^2$$
$$c^2 = 289$$
$$c = 17$$

PTS: 2 REF: 080906ia STA: A.A.45 TOP: Pythagorean Theorem

240 ANS: 3 PTS: 2 REF: 060808ia STA: A.N.8
TOP: Permutations

241 ANS: 2

$$36x^2 - 100y^6 = 4(9x^2 - 25y^6) = 4(3x + 5y^3)(3x - 5y^3)$$

PTS: 2 REF: 081129ia STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

242 ANS: 3 PTS: 2 REF: 081001ia STA: A.S.7
TOP: Scatter Plots

243 ANS: 2

$A(-3,8)$ and $B(3,6)$. $m = \frac{8-6}{-3-3} = \frac{2}{-6} = -\frac{1}{3}$

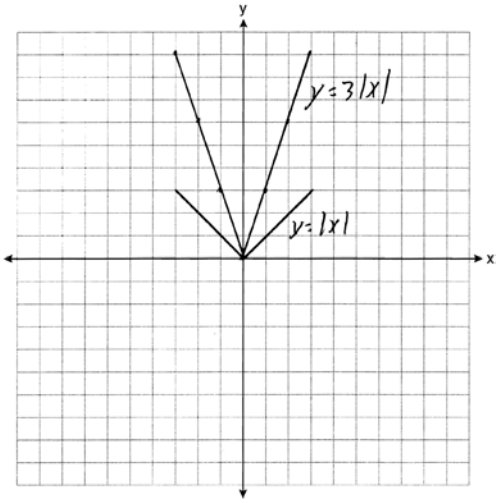
PTS: 2 REF: 081005ia STA: A.A.33 TOP: Slope

244 ANS:

56. If the circumference of circle *O* is 16ð inches, the diameter, $\overline{AD}$, is 16 inches and the length of $\overline{BC}$ is 12 inches $\frac{3}{4} \times 16$. The area of trapezoid *ABCD* is $\frac{1}{2} \times 4(12 + 16) = 56$.

PTS: 3 REF: 060934ia STA: A.G.1 TOP: Compositions of Polygons and Circles
KEY: area

245 ANS:



The graph becomes steeper.

PTS: 3 REF: 081134ia STA: A.G.5 TOP: Graphing Absolute Value Functions

246 ANS: 4

Let *x* = youngest brother and *x* + 4 = oldest brother. $3x - (x + 4) = 48$.

$$2x - 4 = 48$$
$$x = 26$$

PTS: 2 REF: 080928ia STA: A.A.6 TOP: Modeling Equations

247 ANS: 2

$\sqrt{32} = \sqrt{16}\sqrt{2} = 4\sqrt{2}$

PTS: 2 REF: 060910ia STA: A.N.2 TOP: Simplifying Radicals

248 ANS: 4

$P(G \text{ or } W) = \frac{4}{8}$, $P(G \text{ or } B) = \frac{3}{8}$, $P(Y \text{ or } B) = \frac{4}{8}$, $P(Y \text{ or } G) = \frac{5}{8}$

PTS: 2 REF: 060802ia STA: A.S.22 TOP: Geometric Probability

249 ANS:

5,583.86. $A = P(1 + R)^t = 5000(1 + 0.0375)^3 \approx 5583.86$

PTS: 3 REF: 060935ia STA: A.A.9 TOP: Exponential Functions

250 ANS: 1

$13.95 + 0.49s \le 50.00$

$0.49s \le 36.05$

$s \le 73.57$

PTS: 2 REF: 080904ia STA: A.A.6 TOP: Modeling Inequalities

251 ANS: 3

$b = 42 - r \quad r = 2b + 3$

$r = 2b + 3 \quad r = 2(42 - r) + 3$

$r = 84 - 2r + 3$

$3r = 87$

$r = 29$

PTS: 2 REF: 060812ia STA: A.A.7 TOP: Writing Linear Systems

252 ANS: 4

$x^2 - 7x + 6 = 0$

$(x - 6)(x - 1) = 0$

$x = 6 \quad x = 1$

PTS: 2 REF: 060902ia STA: A.A.28 TOP: Roots of Quadratics

253 ANS: 3

$m = \dfrac{1 - (-4)}{-6 - 4} = -\dfrac{1}{2}$

PTS: 2 REF: 060820ia STA: A.A.33 TOP: Slope

254 ANS: 1

$x^2 + 7x + 10 = 0$

$(x + 5)(x + 2) = 0$

$x = -5 \text{ or } -2$

PTS: 2 REF: 080918ia STA: A.A.15 TOP: Undefined Rationals

255 ANS: 2 PTS: 2 REF: 060830ia STA: A.A.9
TOP: Exponential Functions

256 ANS: 2

The set of integers greater than -2 and less than 6 is $\{-1, 0, 1, 2, 3, 4, 5\}$. The subset of this set that is the positive factors of 5 is $\{1, 5\}$. The complement of this subset is $\{-1, 0, 2, 3, 4\}$.

PTS: 2 REF: 060818ia STA: A.A.30 TOP: Set Theory

257 ANS: 4

$\frac{5}{45} = \frac{8}{x}$

$5x = 360$

$x = 72$

PTS: 2 REF: 060901ia STA: A.M.1 TOP: Speed

258 ANS: 2

shaded = whole − unshaded

= rectangle-triangle

$= lw - \frac{1}{2}bh$

$= 15 \times 6 - \frac{1}{2} \times 15 \times 4.6$

$= 90 - 34.5$

$= 55.5$

PTS: 2 REF: 081019ia STA: A.G.1 TOP: Compositions of Polygons and Circles
KEY: area

259 ANS: 4

$16^2 + b^2 = 34^2$

$b^2 = 900$

$b = 30$

PTS: 2 REF: 080809ia STA: A.A.45 TOP: Pythagorean Theorem

260 ANS: 1 PTS: 2 REF: 060903ia STA: A.A.12
TOP: Division of Powers

261 ANS:

2,160 $\frac{1,200}{25} = \frac{x}{45}$

$25x = 54,000$

$x = 2,160$

PTS: 2 REF: 081032ia STA: A.M.1 TOP: Using Rate

262 ANS: 3

$\sin A = \frac{10}{16}$ $B = 180 - (90 = 38.7) = 51.3.$ A 90º angle is not acute.

$A \approx 38.7$

PTS: 2 REF: 080829ia STA: A.A.43 TOP: Using Trigonometry to Find an Angle

263 ANS: 3 PTS: 2 REF: 081008ia STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

264 ANS:
$m = 50¢$, $p = 15¢$. $3m + 2p = 1.80$. $9m + 6p = 5.40$. $4(.50) + 6p = 2.90$

$4m + 6p = 2.90$ $4m + 6p = 2.90$ $6p = .90$

$5m = 2.50$ $p = \$0.15$

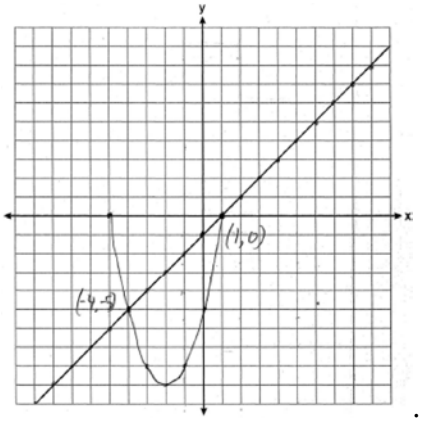
$m = \$0.50$

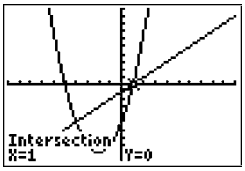
PTS: 3 REF: 080837ia STA: A.A.7 TOP: Writing Linear Systems

265 ANS: 3
$500(1 + 0.06)^3 \approx 596$

PTS: 2 REF: 080929ia STA: A.A.9 TOP: Exponential Functions

266 ANS:





PTS: 4 REF: 080839ia STA: A.G.9 TOP: Quadratic-Linear Systems

267 ANS: 1
$\frac{4}{3}x + 5 < 17$

$\frac{4}{3}x < 12$

$4x < 36$

$x < 9$

PTS: 2 REF: 060914ia STA: A.A.21 TOP: Interpreting Solutions

268 ANS: 4
The other situations are quantitative.

PTS: 2 REF: 081122ia STA: A.S.1 TOP: Analysis of Data

269 ANS: 3
The other situations are quantitative.

PTS: 2 REF: 060819ia STA: A.S.1 TOP: Analysis of Data

270 ANS: 3

$$\frac{2+x}{5x} - \frac{x-2}{5x} = \frac{2+x-x+2}{5x} = \frac{4}{5x}$$

PTS: 2 REF: 081027ia STA: A.A.17 TOP: Addition and Subtraction of Rationals

271 ANS: 3

$2x - 5y = 11$ $2x - 5(-1) = 11$

$-2x + 3y = -9$ $2x = 6$

$-2y = 2$ $x = 3$

$y = -1$

PTS: 2 REF: 081109ia STA: A.A.10 TOP: Solving Linear Systems

272 ANS:

Ann's. $\frac{225}{15} = 15$ mpg is greater than $\frac{290}{23.2} = 12.5$ mpg

PTS: 2 REF: 060831ia STA: A.M.1 TOP: Using Rate

273 ANS: 4

$5(x+4) = 5x + 20$

PTS: 2 REF: 081013ia STA: A.A.1 TOP: Expressions

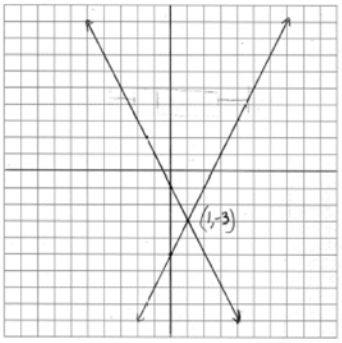
274 ANS:

$$\frac{x-7}{3x} \cdot \frac{2x^2-8x-42}{6x^2} \div \frac{x^2-9}{x^2-3x} = \frac{2(x^2-4x-21)}{6x^2} \cdot \frac{x(x-3)}{(x+3)(x-3)} = \frac{(x-7)(x+3)}{3x} \cdot \frac{1}{x+3} = \frac{x-7}{3x}$$

PTS: 4 REF: 080937ia STA: A.A.18 TOP: Multiplication and Division of Rationals

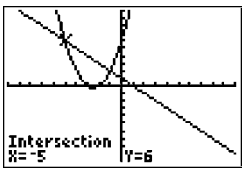
275 ANS: 2 PTS: 2 REF: 080916ia STA: A.G.8
TOP: Solving Quadratics by Graphing

276 ANS:



PTS: 4 REF: 080938ia STA: A.G.7 TOP: Solving Linear Systems

277 ANS: 2



$x^2 + 5x + 6 = -x + 1$. $y = -x + 1$

$x^2 + 6x + 5 = 0$ $= -(-5) + 1$

$(x + 5)(x + 1) = 0$ $= 6$

$x = -5$ or -1

PTS: 2 REF: 080812ia STA: A.A.11 TOP: Quadratic-Linear Systems

278 ANS: 4

$-2(x - 5) < 4$

$-2x + 10 < 4$

$-2x < -6$

$x > 3$

PTS: 2 REF: 080913ia STA: A.A.21 TOP: Interpreting Solutions

279 ANS: 1

$x = \frac{-b}{2a} = \frac{-(-16)}{2(1)} = 8$. $y = (8)^2 - 16(8) + 63 = -1$

PTS: 2 REF: 060918ia STA: A.A.41
TOP: Identifying the Vertex of a Quadratic Given Equation

280 ANS: 2

$\left|\frac{149.6 - 174.2}{149.6}\right| \approx 0.1644$

PTS: 2 REF: 080926ia STA: A.M.3 TOP: Error
KEY: area

281 ANS: 2 PTS: 2 REF: 080823ia STA: A.A.32
TOP: Slope

282 ANS:

$$\frac{m}{5}+\frac{3(m-1)}{2}=2(m-3)$$

$$\frac{2m}{10}+\frac{15(m-1)}{10}=2m-6$$

$$\frac{17m-15}{10}=2m-6$$

$$17m-15=20m-60$$

$$45=3m$$

$$15=m$$

PTS: 4 REF: 081139ia STA: A.A.25
TOP: Solving Equations with Fractional Expressions

283 ANS: 2

$$\left|\frac{13.5-12.8}{13.5}\right|\approx 0.093$$

PTS: 2 REF: 081123ia STA: A.M.3 TOP: Error
KEY: area

284 ANS: 1 PTS: 2 REF: 081030ia STA: A.A.3
TOP: Expressions

285 ANS: 1 PTS: 2 REF: 080803ia STA: A.A.4
TOP: Modeling Inequalities

286 ANS: 2

$$x+2y=9$$

$$x-y=3$$

$$3y=6$$

$$y=2$$

PTS: 2 REF: 060925ia STA: A.A.10 TOP: Solving Linear Systems

287 ANS:

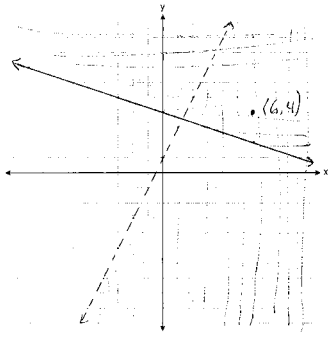
Greg's rate of 5.5 is faster than Dave's rate of 5.3. $\frac{\text{distance}}{\text{time}}=\frac{11}{2}=5.5.\ \frac{16}{3}=5.\overline{3}$

PTS: 3 REF: 080936ia STA: A.M.1 TOP: Speed

288 ANS: 3 PTS: 2 REF: 060924ia STA: A.G.8
TOP: Solving Quadratics by Graphing

289 ANS: 2 PTS: 2 REF: 060821ia STA: A.A.5
TOP: Modeling Inequalities

290 ANS:



PTS: 4 REF: 081037ia STA: A.G.7 TOP: Systems of Linear Inequalities

291 ANS: 1

$m = \dfrac{4-(-4)}{-5-15} = -\dfrac{2}{5}$

PTS: 2 REF: 080915ia STA: A.A.33 TOP: Slope

292 ANS: 3

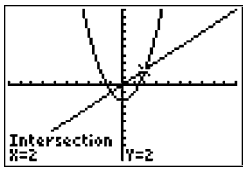
$|-5(5)+12| = |-13| = 13$

PTS: 2 REF: 080923ia STA: A.N.6 TOP: Evaluating Expressions

293 ANS: 2 PTS: 2 REF: 080802ia STA: A.N.1 TOP: Identifying Properties

294 ANS: 4

$x^2 - 2 = x$ Since $y = x$, the solutions are $(2,2)$ and $(-1,-1)$.



$x^2 - x - 2 = 0$

$(x-2)(x+1) = 0$

$x = 2 \text{ or } -1$

PTS: 2 REF: 060810ia STA: A.A.11 TOP: Quadratic-Linear Systems

295 ANS: 4

$\dfrac{2^6}{2^1} = 2^5$

PTS: 2 REF: 060813ia STA: A.A.12 TOP: Division of Powers

296 ANS:

80, 136 $V = lwh = 10 \cdot 2 \cdot 4 = 80$ $SA = 2lw + 2hw + 2lh = 2 \cdot 10 \cdot 2 + 2 \cdot 4 \cdot 2 + 2 \cdot 10 \cdot 4 = 136$

PTS: 3 REF: 081035ia STA: A.G.2 TOP: Surface Area

297 ANS:
315,000, 180,000, the median better represents value since it is closer to more prices than the mean.

PTS: 4 REF: 060839ia STA: A.S.4
TOP: Frequency Histograms, Bar Graphs and Tables

298 ANS: 3

$$a + ar = b + r$$

$$a(1 + r) = b + r$$

$$a = \frac{b + r}{1 + r}$$

PTS: 2 REF: 060913ia STA: A.A.23 TOP: Transforming Formulas

299 ANS: 2

$$\tan B = \frac{\text{opposite}}{\text{adjacent}} = \frac{8}{15} = 0.5\overline{3}$$

PTS: 2 REF: 081026ia STA: A.A.42 TOP: Trigonometric Ratios

300 ANS: 4

$$-3x(x - 4) - 2x(x + 3) = -3x^2 + 12x - 2x^2 - 6x = -5x^2 + 6x$$

PTS: 2 REF: 081114ia STA: A.A.13 TOP: Addition and Subtraction of Monomials

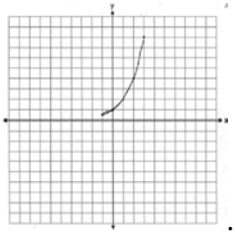
301 ANS: 1 PTS: 2 REF: 081015ia STA: A.G.5
TOP: Graphing Quadratic Functions

302 ANS: 4 PTS: 2 REF: 060906ia STA: A.A.4
TOP: Modeling Inequalities

303 ANS:
$36 - 9\pi$. 15.6. Area of square–area of 4 quarter circles. $(3 + 3)^2 - 3^2\pi = 36 - 9\pi$

PTS: 2 REF: 060832ia STA: A.G.1 TOP: Compositions of Polygons and Circles
KEY: area

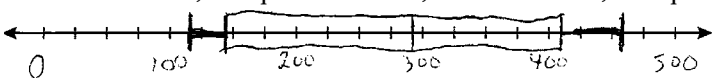
304 ANS:



. The graph will never intersect the *x*-axis as $2^x > 0$ for all values of *x*.

PTS: 3 REF: 080835ia STA: A.G.4 TOP: Graphing Exponential Functions

305 ANS:
minimum is 120, 1st quartile is 145, median is 292, 3rd quartile is 407, and maximum is 452



PTS: 3 REF: 081034ia STA: A.S.5 TOP: Box-and-Whisker Plots

306 ANS: 4

$$\frac{25x-125}{x^2-25}=\frac{25(x-5)}{(x+5)(x-5)}=\frac{25}{x+5}$$

PTS: 2 REF: 080821ia STA: A.A.16 TOP: Rational Expressions
KEY: a > 0

307 ANS:

$y=\frac{2}{5}x+2.\ m=\frac{4-0}{5-(-5)}=\frac{2}{5}.\ y=mx+b$.

$$4=\frac{2}{5}(5)+b$$

$$b=2$$

PTS: 3 REF: 080836ia STA: A.A.35 TOP: Writing Linear Equations

308 ANS:

$$-3\sqrt{48}=-3\sqrt{16}\sqrt{3}=-12\sqrt{3}$$

PTS: 2 REF: 081033ia STA: A.N.2 TOP: Simplifying Radicals

309 ANS: 3 PTS: 2 REF: 081103ia STA: A.A.30
TOP: Set Theory

310 ANS: 1 PTS: 2 REF: 060920ia STA: A.G.6
TOP: Linear Inequalities

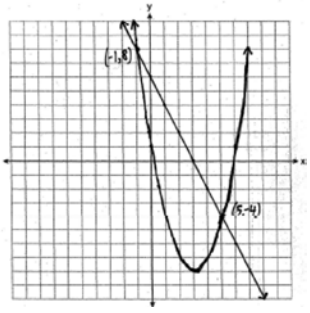
311 ANS: 2

$$\frac{2x^2-12x}{x-6}=\frac{2x(x-6)}{x-6}=2x$$

PTS: 2 REF: 060824ia STA: A.A.16 TOP: Rational Expressions
KEY: a > 0

312 ANS: 3 PTS: 2 REF: 081117ia STA: A.A.29
TOP: Set Theory

313 ANS:



PTS: 4 REF: 060939ia STA: A.G.9 TOP: Quadratic-Linear Systems

314 ANS: 2

$\sin A = \frac{8}{12}$

$A \approx 42$

PTS: 2 REF: 060816ia STA: A.A.43 TOP: Using Trigonometry to Find an Angle

315 ANS: 3

$(3-1) \times 2 \times 3 = 12$

PTS: 2 REF: 080905ia STA: A.N.7 TOP: Conditional Probability

316 ANS: 3

An element of the domain, 1, is paired with two different elements of the range, 3 and 7.

PTS: 2 REF: 080919ia STA: A.G.3 TOP: Defining Functions

317 ANS: 1

$\left|\frac{289-282}{289}\right| \approx 0.024$

PTS: 2 REF: 080828ia STA: A.M.3 TOP: Error
KEY: volume and surface area

318 ANS: 1 PTS: 2 REF: 081110ia STA: A.A.1
TOP: Expressions

319 ANS: 4 PTS: 2 REF: 081011ia STA: A.A.5
TOP: Modeling Equations

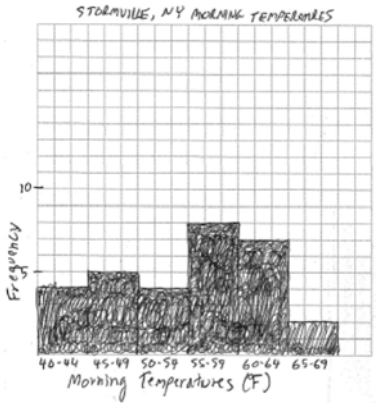
320 ANS: 2

The volume of the cube using Ezra's measurements is 8 (2^3). The actual volume is 9.261 (2.1^3). The relative error is $\left|\frac{9.261-8}{9.261}\right| \approx 0.14$.

PTS: 2 REF: 060928ia STA: A.M.3 TOP: Error
KEY: volume and surface area

321 ANS:

Interval	Tally	Frequency
40–44	IIII	4
45–49	𝍸	5
50–54	IIII	4
55–59	𝍸 III	8
60–64	𝍸 II	7
65–69	II	2



PTS: 4 REF: 060938ia STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables KEY: frequency histograms

322 ANS: 1
The slope of both is –4.

PTS: 2 REF: 060814ia STA: A.A.38 TOP: Parallel and Perpendicular Lines

323 ANS: 3
$P(O) = \frac{5}{10}, P(P) = \frac{4}{10}, P(\leq 5) = \frac{6}{10}, P(/3) = \frac{4}{10}$

PTS: 2 REF: 081125ia STA: A.S.22 TOP: Theoretical Probability

324 ANS:
$\frac{1}{6}$, 16.67%, \$13.50. $\frac{18-15}{18} = \frac{1}{6}$. $18 \times 0.75 = 13.5$

PTS: 3 REF: 060835ia STA: A.N.5 TOP: Percents

325 ANS:
$-2\sqrt{3}\ \ \frac{16\sqrt{21}}{2\sqrt{7}} - 5\sqrt{12} = 8\sqrt{3} - 5\sqrt{4}\sqrt{3} = 8\sqrt{3} - 10\sqrt{3} = -2\sqrt{3}$

PTS: 3 REF: 081136ia STA: A.N.3 TOP: Operations with Radicals

326 ANS: 2
$l(l-3) = 40$

$l^2 - 3l - 40 = 0$

$(l-8)(l+5) = 0$

$l = 8$

PTS: 2 REF: 081116ia STA: A.A.8 TOP: Geometric Applications of Quadratics

327 ANS: 3 PTS: 2 REF: 060919ia STA: A.G.3
TOP: Defining Functions

328 ANS:
60. ${}_5P_3 = 60$

PTS: 2 REF: 060931ia STA: A.N.8 TOP: Permutations

329 ANS: 2
$2000(1+0.04)^3 \approx 2249$

PTS: 2 REF: 081124ia STA: A.A.9 TOP: Exponential Functions

330 ANS: 3

$P(S) \cdot P(M) = P(S \text{ and } M)$

$\frac{3}{5} \cdot P(M) = \frac{3}{10}$

$P(M) = \frac{1}{2}$

PTS: 2 REF: 081024ia STA: A.S.23 TOP: Theoretical Probability
KEY: independent events

331 ANS: 3 PTS: 2 REF: 081009ia STA: A.A.30
TOP: Set Theory

332 ANS:

$77120 + 33500 = 110620 \text{ sq. ft.} \times \frac{1 \text{ acre}}{43560 \text{ sq. ft.}} \approx 2.54 \text{ acres}$

PTS: 2 REF: 081133ia STA: A.M.2 TOP: Conversions

333 ANS: 2

$\tan ABC = \frac{\text{opposite}}{\text{adjacent}} = \frac{5}{12}$

PTS: 2 REF: 081112ia STA: A.A.42 TOP: Trigonometric Ratios

334 ANS:

$-15, 2 \quad x^2 + 13x - 30 = 0$

$(x + 15)(x - 2) = 0$

$x = -15, 2$

PTS: 3 REF: 081036ia STA: A.A.28 TOP: Roots of Quadratics

335 ANS: 2

$\frac{3}{5}(x + 2) = x - 4$

$3(x + 2) = 5(x - 4)$

$3x + 6 = 5x - 20$

$26 = 2x$

$x = 13$

PTS: 2 REF: 080909ia STA: A.A.25
TOP: Solving Equations with Fractional Expressions

336 ANS: 1 PTS: 2 REF: 080902ia STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

337 ANS: 1 PTS: 2 REF: 060807ia STA: A.A.13
TOP: Multiplication of Polynomials

338 ANS: 3

0.75 hours = 45 minutes. $\frac{120}{1} = \frac{x}{45}$

$x = 5400$

PTS: 2 REF: 080814ia STA: A.M.1 TOP: Using Rate

339 ANS: 4

$\frac{2+3+0+1+3+2+4+0+2+3}{10} = \frac{20}{10} = 2 \quad \frac{x}{10} = 2 + 0.5$

$x = 25$

PTS: 2 REF: 081020ia STA: A.S.16 TOP: Average Known with Missing Data

340 ANS: 1 PTS: 2 REF: 080824ia STA: A.A.43
TOP: Using Trigonometry to Find an Angle

341 ANS:

$\frac{1}{8}$. After the English and social studies books are taken, 8 books are left and 1 is an English book.

PTS: 2 REF: 060933ia STA: A.S.18 TOP: Conditional Probability

342 ANS: 4

$\frac{x^2-1}{x+1} \cdot \frac{x+3}{3x-3} = \frac{(x+1)(x-1)}{x+1} \cdot \frac{x+3}{3(x-1)} = \frac{x+3}{3}$

PTS: 2 REF: 060815ia STA: A.A.18 TOP: Multiplication and Division of Rationals

343 ANS: 1

$y = mx + b$

$5 = (-2)(1) + b$

$b = 7$

PTS: 2 REF: 081108ia STA: A.A.34 TOP: Writing Linear Equations

344 ANS: 3

$x^2 - 6x = 0$

$x(x-6) = 0$

$x = 0 \quad x = 6$

PTS: 2 REF: 080921ia STA: A.A.27 TOP: Solving Quadratics by Factoring

345 ANS: 1 PTS: 2 REF: 081102ia STA: A.S.12
TOP: Scatter Plots

346 ANS: 2

$2x^2 + 10x - 12 = 2(x^2 + 5x - 6) = 2(x+6)(x-1)$

PTS: 2 REF: 080806ia STA: A.A.20 TOP: Factoring Polynomials

347 ANS: 3

$3^2 + 5^2 = x^2$

$34 = x^2$

$\sqrt{34} = x$

PTS: 2 REF: 060909ia STA: A.A.45 TOP: Pythagorean Theorem

348 ANS: 1 PTS: 2 REF: 060804ia STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

349 ANS: 3 PTS: 2 REF: 060926ia STA: A.N.1
TOP: Properties of Reals

350 ANS:

$bc + ac = ab$

$c(b + a) = ab$

$c = \frac{ab}{b + a}$

PTS: 2 REF: 081131ia STA: A.A.23 TOP: Transforming Formulas

351 ANS:

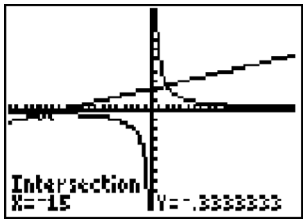
$\frac{3}{8}$. $P(s_1 < 4) \times P(s_2 = \text{back}) = \frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$

PTS: 2 REF: 080832ia STA: A.S.23 TOP: Geometric Probability

352 ANS: 3 PTS: 2 REF: 081118ia STA: A.G.4
TOP: Families of Functions

353 ANS: 4

$\frac{5}{x} = \frac{x + 13}{6}$



$x^2 + 13x = 30$

$x^2 + 13x - 30 = 0$

$(x + 15)(x - 2) = 0$

$x = -15 \text{ or } 2$

PTS: 2 REF: 060826ia STA: A.A.26 TOP: Solving Rationals

354 ANS: 2

$x^2 - 5x + 6 = 0$

$(x-3)(x-2) = 0$

$x = 3 \quad x = 2$

PTS: 2 REF: 081120ia STA: A.A.28 TOP: Roots of Quadratics

355 ANS: 3

$25 - 18 = 7$

PTS: 2 REF: 060822ia STA: A.S.9

TOP: Frequency Histograms, Bar Graphs and Tables

356 ANS:

$3a^2b^2 - 6a$. $\dfrac{45a^4b^3 - 90a^3b}{15a^2b} = \dfrac{45a^4b^3}{15a^2b} - \dfrac{90a^3b}{15a^2b} = 3a^2b^2 - 6a$

PTS: 2 REF: 081031ia STA: A.A.14 TOP: Division of Polynomials

357 ANS:

$\dfrac{3}{8}$. (H,H,H), (H,H,T), (H,T,H), **(H,T,T)**, (T,H,H), **(T,H,T)**, **(T,T,H)**, (T,T,T)

PTS: 2 REF: 080933ia STA: A.S.19 TOP: Sample Space

358 ANS: 1 PTS: 2 REF: 080911ia STA: A.A.36

TOP: Parallel and Perpendicular Lines

359 ANS: 3

The other situations are quantitative.

PTS: 2 REF: 060905ia STA: A.S.1 TOP: Analysis of Data

360 ANS: 1

$7 + 8 + 7 + \dfrac{12\pi}{2} = 22 + 6\pi$

PTS: 2 REF: 081128ia STA: A.G.1 TOP: Compositions of Polygons and Circles

KEY: perimeter

361 ANS: 1

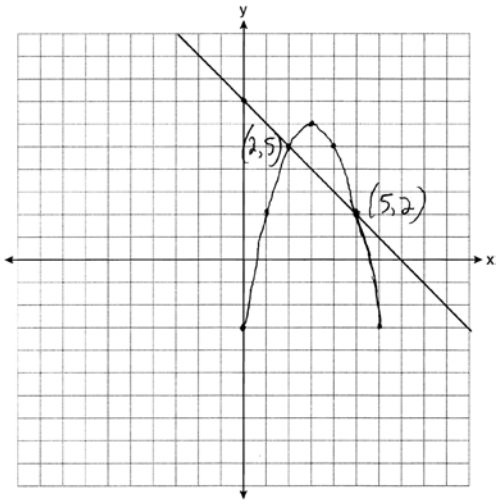
$2y - 2x = 10$ axis of symmetry: $x = \dfrac{-b}{2a} = \dfrac{-2}{2(1)} = -1$

$2y = 2x + 10$

$y = x + 5$

PTS: 2 REF: 081010ia STA: A.G.9 TOP: Quadratic-Linear Systems

362 ANS:



PTS: 4 REF: 081138ia STA: A.G.9 TOP: Quadratic-Linear Systems

363 ANS: 4 PTS: 2 REF: 060930ia STA: A.A.29
TOP: Set Theory

364 ANS:
5,112. $(12 \times 30 \times 16) - (6 \times 12 \times 9) = 5112$

PTS: 2 REF: 080932ia STA: A.G.2 TOP: Volume

365 ANS:
30.4%; no, 23.3%. $\frac{7.50 - 5.75}{5.75} = 30.4\%$. $\frac{7.50 - 5.75}{7.50} = 23.3\%$

PTS: 3 REF: 080935ia STA: A.N.5 TOP: Percents

366 ANS: 4
$A = \{2, 4, 6, 8, 10, 12, 14, 16, 18, 20\}$

PTS: 2 REF: 080912ia STA: A.A.30 TOP: Set Theory

367 ANS:
{1,2,4,5,9,10,12}

PTS: 2 REF: 080833ia STA: A.A.30 TOP: Set Theory

368 ANS: 4 PTS: 2 REF: 060916ia STA: A.A.15
TOP: Undefined Rationals

369 ANS: 2 PTS: 2 REF: 060923ia STA: A.A.13
TOP: Addition and Subtraction of Polynomials KEY: subtraction

370 ANS:
$w(w+15) = 54$, 3, 18. $w(w+15) = 54$

$$w^2 + 15w - 54 = 0$$
$$(w+18)(w-3) = 0$$
$$w = 3$$

PTS: 4 REF: 060837ia STA: A.A.8 TOP: Geometric Applications of Quadratics

371 ANS: 2
$5\sqrt{20} = 5\sqrt{4}\sqrt{5} = 10\sqrt{5}$

PTS: 2 REF: 080922ia STA: A.N.2 TOP: Simplifying Radicals

372 ANS: 2
$\sqrt{5^2 + 7^2} \approx 8.6$

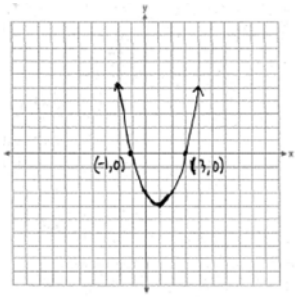
PTS: 2 REF: 081004ia STA: A.A.45 TOP: Pythagorean Theorem

373 ANS: 3
$V = \pi r^2 h = \pi \cdot 5^2 \cdot 2.3 \approx 180.6$

PTS: 2 REF: 081105ia STA: A.G.2 TOP: Volume

374 ANS: 3 PTS: 2 REF: 080925ia STA: A.G.4
TOP: Identifying the Equation of a Graph

375 ANS:



PTS: 3 REF: 060836ia STA: A.G.8 TOP: Solving Quadratics by Graphing

376 ANS: 2
$1.5^3 = 3.375$

PTS: 2 REF: 060809ia STA: A.G.2 TOP: Volume

377 ANS: 1 PTS: 2 REF: 080813ia STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

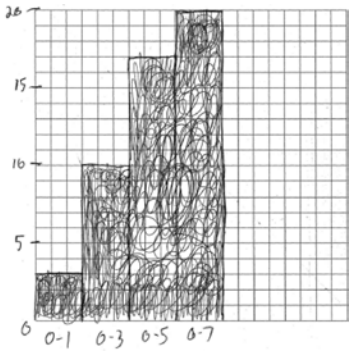
378 ANS:

Number of Days Outside

Interval	Tally	Frequency
0–1	III	3
2–3	IIII II	7
4–5	IIII II	7
6–7	III	3

Number of Days Outside

Interval	Cumulative Frequency
0–1	3
0–3	10
0–5	17
0–7	20



PTS: 4 REF: 080838ia STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables KEY: cumulative frequency histograms

379 ANS: 2 PTS: 2 REF: 060908ia STA: A.S.21
TOP: Empirical Probability

380 ANS: 4
Surveying persons leaving a football game about a sports budget contains the most bias.

PTS: 2 REF: 080910ia STA: A.S.3 TOP: Analysis of Data

381 ANS:

$$\frac{4}{12}\times\frac{2}{11}\times\frac{1}{10}=\frac{8}{1320}\quad \frac{6}{12}\times\frac{5}{11}\times\frac{4}{10}+\frac{4}{12}\times\frac{3}{11}\times\frac{2}{10}=\frac{120}{1320}+\frac{24}{1320}=\frac{144}{1320}$$

PTS: 4 REF: 081137ia STA: A.S.23 TOP: Theoretical Probability
KEY: dependent events

382 ANS: 1 PTS: 2 REF: 080924ia STA: A.G.1
TOP: Compositions of Polygons and Circles KEY: perimeter

383 ANS: 2

$$\frac{6}{4a}-\frac{2}{3a}=\frac{18a-8a}{12a^2}=\frac{10a}{12a^2}=\frac{5}{6a}$$

PTS: 2 REF: 060929ia STA: A.A.17 TOP: Addition and Subtraction of Rationals

384 ANS: 2 PTS: 2 REF: 060904ia STA: A.A.1
TOP: Expressions

385 ANS:
$10+2d\geq 75$, 33. $10+2d\geq 75$

$$d\geq 32.5$$

PTS: 3 REF: 060834ia STA: A.A.6 TOP: Modeling Inequalities

386 ANS:
Hat *A*, add 1 not green to Hat *A*, add 11 green to Hat *B*, and add none to Hat *C*.

PTS: 4 REF: 081038ia STA: A.S.22 TOP: Theoretical Probability

387 ANS: 2 PTS: 2 REF: 080815ia STA: A.G.1
TOP: Compositions of Polygons and Circles KEY: area

388 ANS:
$60 - 42\sqrt{5}$. $3\sqrt{20}(2\sqrt{5} - 7) = 6\sqrt{100} - 21\sqrt{20} = 60 - 21\sqrt{4}\sqrt{5} = 60 - 42\sqrt{5}$

PTS: 3 REF: 080834ia STA: A.N.3 TOP: Operations with Radicals
KEY: multiplication

389 ANS: 4
$SA = 2lw + 2hw + 2lh = 2(3)(1.5) + 2(2)(1.5) + 2(3)(2) = 27$

PTS: 2 REF: 060827ia STA: A.G.2 TOP: Surface Area

390 ANS: 4 PTS: 2 REF: 081025ia STA: A.G.4
TOP: Families of Functions

391 ANS: 1
$b = 2j + 4$ $2j + 4 = 31 - j$

$b + j = 31$ $3j = 27$

$b = 31 - j$ $j = 9$

PTS: 2 REF: 081119ia STA: A.A.7 TOP: Writing Linear Systems

392 ANS: 4 PTS: 2 REF: 060927ia STA: A.N.4
TOP: Operations with Scientific Notation

393 ANS: 4
$y = mx + b$

$-1 = (2)(3) + b$

$b = -7$

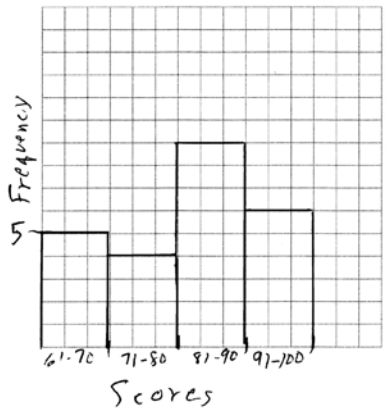
PTS: 2 REF: 080927ia STA: A.A.34 TOP: Writing Linear Equations

394 ANS: 2 PTS: 2 REF: 081106ia STA: A.S.6
TOP: Box-and-Whisker Plots

395 ANS: 4
$\frac{9.2 \times 10^6}{2.3 \times 10^2} = 4 \times 10^4$

PTS: 2 REF: 081006ia STA: A.N.4 TOP: Operations with Scientific Notation

396 ANS:



PTS: 2 REF: 081132ia STA: A.S.5
TOP: Frequency Histograms, Bar Graphs and Tables KEY: frequency histograms

397 ANS: 2

Candidate *B* received 45%. $45\% \times 1860 = 837$

PTS: 2 REF: 081007ia STA: A.N.5 TOP: Percents

398 ANS: 4 PTS: 2 REF: 060829ia STA: A.G.5
TOP: Graphing Quadratic Functions

399 ANS: 3

The value of the third quartile is the last vertical line of the box.

PTS: 2 REF: 080818ia STA: A.S.6 TOP: Box-and-Whisker Plots

400 ANS: 3 PTS: 2 REF: 080819ia STA: A.A.13
TOP: Addition and Subtraction of Polynomials KEY: subtraction

401 ANS:

$0 \le t \le 40$

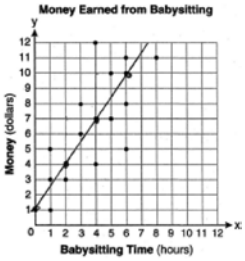
PTS: 2 REF: 060833ia STA: A.A.31 TOP: Set Theory

402 ANS:

618.45, 613.44, 0.008. $21.7 \times 28.5 = 618.45$. $21.6 \times 28.4 = 613.44$. $\left|\frac{618.45 - 613.44}{613.44}\right| \approx 0.008$. An error of less than 1% would seem to be insignificant.

PTS: 4 REF: 060838ia STA: A.M.3 TOP: Error
KEY: area

403 ANS: 4



PTS: 2 REF: 080822ia STA: A.S.8 TOP: Scatter Plots

404 ANS: 2

$$l(l-5)=24$$

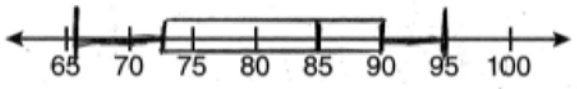
$$l^2-5l-24=0$$

$$(l-8)(l+3)=0$$

$$l=8$$

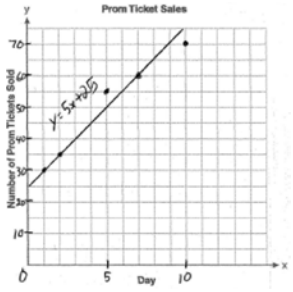
PTS: 2 REF: 080817ia STA: A.A.8 TOP: Geometric Applications of Quadratics

405 ANS:



PTS: 4 REF: 080939ia STA: A.S.5 TOP: Box-and-Whisker Plots

406 ANS:



PTS: 3 REF: 060936ia STA: A.S.8 TOP: Scatter Plots

407 ANS: 2 PTS: 2 REF: 081104ia STA: A.S.14 TOP: Analysis of Data

408 ANS: 2

$$m=\frac{5-3}{8-1}=\frac{2}{7} \quad y-y_1=m(x-x_i)$$

$$y-5=\frac{2}{7}(x-8)$$

PTS: 2 REF: 081029ia STA: A.A.35 TOP: Writing Linear Equations

409 ANS: 2

$$\frac{x^2 - 2x - 15}{x^2 + 3x} = \frac{(x-5)(x+3)}{x(x+3)} = \frac{x-5}{x}$$

PTS: 2 REF: 060921ia STA: A.A.16 TOP: Rational Expressions
KEY: a > 0

410 ANS: 3 PTS: 2 REF: 060825ia STA: A.A.45
TOP: Pythagorean Theorem

411 ANS: 4 PTS: 2 REF: 081107ia STA: A.A.5
TOP: Modeling Inequalities

412 ANS: 2 PTS: 2 REF: 081111ia STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

413 ANS: 1

To determine student interest, survey the widest range of students.

PTS: 2 REF: 060803ia STA: A.S.3 TOP: Analysis of Data

414 ANS: 4 PTS: 2 REF: 081022ia STA: A.A.29
TOP: Set Theory

415 ANS: 4 PTS: 2 REF: 060805ia STA: A.S.12
TOP: Scatter Plots

416 ANS: 2

$3c + 4m = 12.50$

$3c + 2m = 8.50$

$2m = 4.00$

$m = 2.00$

PTS: 2 REF: 060806ia STA: A.A.7 TOP: Writing Linear Systems

417 ANS: 4 PTS: 2 REF: 080825ia STA: A.A.40
TOP: Systems of Linear Inequalities

418 ANS: 1

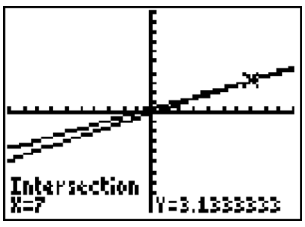
$y = mx + b$

$-6 = (-3)(4) + b$

$b = 6$

PTS: 2 REF: 060922ia STA: A.A.34 TOP: Writing Linear Equations

419 ANS: 4



$$\frac{2x}{5}+\frac{1}{3}=\frac{7x-2}{15}$$

$$\frac{(2x\times 3)+(5\times 1)}{5\times 3}=\frac{7x-2}{15}$$

$$\frac{6x+5}{15}=\frac{7x-2}{15}$$

$$6x+5=7x-2$$

$$x=7$$

PTS: 2 REF: 080820ia STA: A.A.25
TOP: Solving Equations with Fractional Expressions

420 ANS: 1

$so=f+60\ \ j=2f-50\ \ se=3f.\ \ f+(f+60)+(2f-50)+3f=1424$

$$7f+10=1424$$

$$f=202$$

PTS: 2 REF: 060917ia STA: A.A.7 TOP: Writing Linear Systems

421 ANS:

(–2,11). $x=\frac{-b}{2a}=\frac{-(-8)}{2(-2)}=-2$

$y=-2(-2)^2-8(-2)+3=11$

PTS: 3 REF: 080934ia STA: A.A.41
TOP: Identifying the Vertex of a Quadratic Given Equation

422 ANS: 3

$3ax+b=c$

$$3ax=c-b$$

$$x=\frac{c-b}{3a}$$

PTS: 2 REF: 080808ia STA: A.A.23 TOP: Transforming Formulas

423 ANS: 4

$2x - 3y = 9$

$2(0) - 3(-3) = 9$

$0 + 9 = 9$

PTS: 2 REF: 081016ia STA: A.A.39 TOP: Identifying Points on a Line

424 ANS:

$4x(x + 3)(x - 3)$. $4x^3 - 36x = 4x(x^2 - 9) = 4x(x + 3)(x - 3)$

PTS: 2 REF: 060932ia STA: A.A.19
TOP: Factoring the Difference of Perfect Squares

425 ANS: 3 PTS: 2 REF: 080907ia STA: A.S.20
TOP: Geometric Probability

426 ANS: 1

$x - 2y = 1$

$x + 4y = 7$

$-6y = -6$

$y = 1$

PTS: 2 REF: 080920ia STA: A.A.10 TOP: Solving Linear Systems

427 ANS: 3

mean = 6, median = 6 and mode = 7

PTS: 2 REF: 080804ia STA: A.S.4 TOP: Central Tendency

428 ANS: 2 PTS: 2 REF: 080810ia STA: A.A.36
TOP: Parallel and Perpendicular Lines

429 ANS: 3

${}_6P_4 = 360$

PTS: 2 REF: 081028ia STA: A.N.8 TOP: Permutations

430 ANS: 2 PTS: 2 REF: 081127ia STA: A.A.40
TOP: Systems of Linear Inequalities

431 ANS: 2 PTS: 2 REF: 080901ia STA: A.A.4
TOP: Modeling Equations

432 ANS: 1

$3(2m - 1) \le 4m + 7$

$6m - 3 \le 4m + 7$

$2m \le 10$

$m \le 5$

PTS: 2 REF: 081002ia STA: A.A.24 TOP: Solving Inequalities

433 ANS:
Not all of the homework problems are equations. The first problem is an expression.

PTS: 2 REF: 080931ia STA: A.A.3 TOP: Expressions

434 ANS: 2

$\tan 32 = \frac{x}{25}$

$x \approx 15.6$

PTS: 2 REF: 080914ia STA: A.A.44 TOP: Using Trigonometry to Find a Side

435 ANS: 2

$\frac{3}{2x} + \frac{4}{3x} = \frac{9x + 8x}{6x^2} = \frac{17x}{6x^2} = \frac{17}{6x}$

PTS: 2 REF: 080917ia STA: A.A.17 TOP: Addition and Subtraction of Rationals

436 ANS: 2

The events are not mutually exclusive: P(prime) = $\frac{3}{6}$, P(even) = $\frac{3}{6}$, P(prime AND even) = $\frac{1}{6}$

P(prime OR even) = $\frac{3}{6} + \frac{3}{6} - \frac{1}{6} = \frac{5}{6}$

PTS: 2 REF: 080830ia STA: A.S.23 TOP: Theoretical Probability
KEY: not mutually exclusive events

437 ANS: 1 PTS: 2 REF: 060811ia STA: A.G.10
TOP: Identifying the Vertex of a Quadratic Given Graph

438 ANS: 2

$s + o = 126.\ s + 2s = 126$

$o = 2s \qquad s = 42$

PTS: 2 REF: 080811ia STA: A.A.7 TOP: Writing Linear Systems

439 ANS: 2

$\left|\frac{55.42 - 50.27}{55.42}\right| \approx 0.093$

PTS: 2 REF: 081023ia STA: A.M.3 TOP: Error
KEY: area

440 ANS: 4 PTS: 2 REF: 080827ia STA: A.A.12
TOP: Powers of Powers

441 ANS: 4

$\frac{344\,\text{m}}{\text{sec}} \times \frac{60\,\text{sec}}{1\,\text{min}} \times \frac{60\,\text{min}}{1\,\text{hr}} = 1{,}238{,}400\,\frac{\text{m}}{\text{hr}}$

PTS: 2 REF: 060911ia STA: A.M.2 TOP: Conversions

442 ANS: 1

$-3(-4)^2(2) + 4(-4) = -96 - 16 = -112$

PTS: 2 REF: 081113ia STA: A.N.6 TOP: Evaluating Expressions

443 ANS: 1 PTS: 2 REF: 081115ia STA: A.A.32
TOP: Slope

444 ANS: 2 PTS: 2 REF: 081014ia STA: A.A.36
TOP: Parallel and Perpendicular Lines

445 ANS:

39, 63. $\tan 52 = \frac{50}{x}$. $\sin 52 = \frac{50}{x}$

$x \approx 39$ $x \approx 63$

PTS: 4 REF: 060937ia STA: A.A.44 TOP: Using Trigonometry to Find a Side

446 ANS: 2

$\cos 38 = \frac{10}{x}$

$x = \frac{10}{\cos 38} \approx 12.69$

PTS: 2 REF: 081126ia STA: A.A.44 TOP: Using Trigonometry to Find a Side

447 ANS: 4 PTS: 2 REF: 080903ia STA: A.A.12
TOP: Multiplication of Powers

448 ANS: 2 PTS: 2 REF: 080930ia STA: A.S.17
TOP: Scatter Plots

449 ANS: 4

$-6x - 17 \geq 8x + 25$

$-42 \geq 14x$

$-3 \geq x$

PTS: 2 REF: 081121ia STA: A.A.24 TOP: Solving Inequalities

450 ANS: 1 PTS: 2 REF: 060801ia STA: A.G.4
TOP: Families of Functions

451 ANS: 3

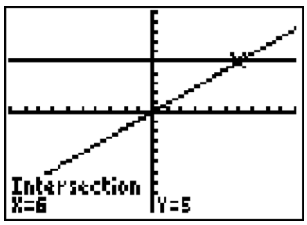
$x = \frac{-b}{2a} = \frac{-10}{2(-1)} = 5.$

PTS: 2 REF: 081018ia STA: A.A.41
TOP: Identifying the Vertex of a Quadratic Given Equation

452 ANS: 3 PTS: 2 REF: 081017a STA: A.S.14
TOP: Analysis of Data

453 ANS: 2 PTS: 2 REF: 081003ia STA: A.A.31
TOP: Set Theory

454 ANS: 1



$$\frac{(2x \times 6) + (3 \times x)}{3 \times 6} = 5$$

$$\frac{12x + 3x}{18} = 5$$

$$15x = 90$$

$$x = 6$$

PTS: 2 REF: 060907ia STA: A.A.25
TOP: Solving Equations with Fractional Expressions

455 ANS: 2

$$2(x - 3y = -3)$$

$$2x + y = 8$$

$$2x - 6y = -6$$

$$7y = 14$$

$$y = 2$$

PTS: 2 REF: 081021ia STA: A.A.10 TOP: Solving Linear Systems

456 ANS:

84, 71 $\sin 50 = \frac{x}{110}$ $\cos 50 = \frac{y}{110}$

$x \approx 84$ $y \approx 71$

PTS: 4 REF: 081039ia STA: A.A.44 TOP: Using Trigonometry to Find a Side

457 ANS: 4

$$\frac{150}{20} = \frac{x}{30}$$

$$20x = 4500$$

$$x = 225$$

PTS: 2 REF: 081101ia STA: A.N.5 TOP: Direct Variation

458 ANS:

41.8. $\sin x = \frac{8}{12}$

$A \approx 41.8$

PTS: 3 REF: 081135ia STA: A.A.43 TOP: Using Trigonometry to Find an Angle

459 ANS: 1

$$\frac{4x}{x-1} \cdot \frac{x^2-1}{3x+3} = \frac{4x}{x-1} \cdot \frac{(x+1)(x-1)}{3(x+1)} = \frac{4x}{3}$$

PTS: 2 REF: 080826ia STA: A.A.18 TOP: Multiplication and Division of Rationals

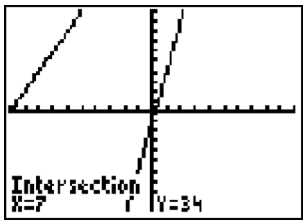
460 ANS: 2

If the car can travel 75 miles on 4 gallons, it can travel 300 miles on 16 gallons. $\frac{75}{4} = \frac{x}{16}$.

$$x = 300$$

PTS: 2 REF: 080807ia STA: A.G.4 TOP: Graphing Linear Functions

461 ANS: 4

$5p - 1 = 2p + 20$ 

$$3p = 21$$

$$p = 7$$

PTS: 2 REF: 080801ia STA: A.A.22 TOP: Solving Equations

462 ANS: 1

$${}_4P_4 = 4 \times 3 \times 2 \times 1 = 24$$

PTS: 2 REF: 080816ia STA: A.N.8 TOP: Permutations

463 ANS: 4

$-4x + 2 > 10$

$$-4x > 8$$

$$x < -2$$

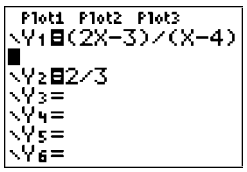
PTS: 2 REF: 080805ia STA: A.A.21 TOP: Interpreting Solutions

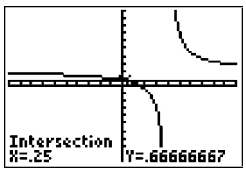
464 ANS: 4

$25(x - 3) = 25x - 75$

PTS: 2 REF: 060823ia STA: A.A.1 TOP: Expressions

465 ANS: 2





$$\frac{2x-3}{x-4}=\frac{2}{3}$$

$$3(2x-3)=2(x-4)$$

$$6x-9=2x-8$$

$$4x=1$$

$$x=\frac{1}{4}$$

PTS: 2 REF: 081012ia STA: A.A.26 TOP: Solving Rationals

466 ANS: 3

The value of the upper quartile is the last vertical line of the box.

PTS: 2 REF: 060915ia STA: A.S.6 TOP: Box-and-Whisker Plots

467 ANS: 1

$$\frac{\sqrt{32}}{4}=\frac{\sqrt{16}\sqrt{2}}{4}=\sqrt{2}$$

PTS: 2 REF: 060828ia STA: A.N.2 TOP: Simplifying Radicals

468 ANS:

111.25. $\frac{\text{distance}}{\text{time}}=\frac{89}{0.8}=111.25$

PTS: 2 REF: 080831ia STA: A.M.1 TOP: Speed